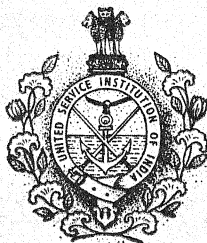


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by Commander RAVI KAUL

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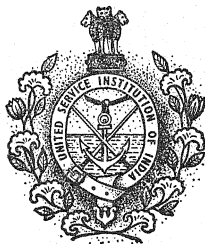
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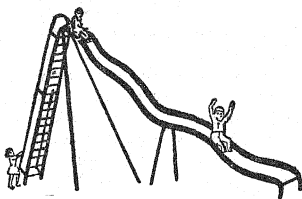
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IN AID OF THE CIVIL POWER

MAJOR GENERAL SK SINHA, PVSM

THE Army's secondary role is to aid the civil power when called upon. The Army is required to aid and not to replace the civil power and the decision to call for its aid rests entirely with the latter. This aid may take the form of assistance in the maintenance of law and order, of running essential services or of help during natural calamities. The first is the most common form of aid required to be rendered and this paper confines itself to this aspect.

The primary task of the soldier is to defend his people against external aggression. Assistance in restoring order involves operating against one's own people, albeit against only certain misguided elements. This is an unpleasant assignment for the soldier. However, in a society where violence erupts so frequently, a soldier has to be increasingly prepared to face this unpalatable task. During the period 1961 to 1970, the Army had to be called out in aid of the civil power on no fewer than 476 Occasions.

CALLING OUT OF TROOPS-LAST RESORT

The calling out of troops is the last resort of the Government to maintain order. This implies that troops should be called out only when there is no other alternative and when the normal civil agencies of the Government have not been able to cope with the situation. It also implies that troops so called out cannot afford to fail in their mission because if they do, the door is flung wide open to anarchy. These implications require careful consideration both by the authorities who requisition military assistance and by the troops who have to respond to such requisition.

Civil authorities requisitioning military aid should appreciate that frequent employment of troops in this role erodes their credibility as a deterrent. If they are called out too often, the salutary effect of their employment will be lost on the anti-social elements. Consequently, troops may have to take harsher action than what would otherwise have sufficed. Since 1947 there has been a considerable proliferation of armed police units both at the Centre and in the States. The civil Government should therefore be able to meet a violent situation with their own resources and the Army should be called out very sparingly.

The decision to retain olive green for Army uniform after the Second World War was related to the need for retaining this deterrent effect. This question was debated at length at the then General Headquarters. (India), subsequently redesignated Army Headquarters. The point at issue was the colour of the uniform to be adopted by the Indian Army. One view was to go back to the khaki of pre-war days which was considered smarter. Moreover its texture, unlike that of the olive green of those days, did not change so quickly. The other view was that there were billions of bales of olive green lying in the depots and a change-over to khaki would lead to infructuous expenditure, assuming that both khaki and olive green could not be in simultaneous use till the latter was wasted out. The then Commander-in-chief, Field Marshal Auchinleck, decided that the Indian Army should retain olive green and his reasons for doing so were significant. He foresaw an increasing period of violence in which troops would have to be used in aid of the civil power. If the uniforms of the police and the army were more or less identical, the deterrent effect of the latter would be lost. Therefore, he felt that the Army should retain olive green which stands out in comparison with the khaki in use by the police. The wisdom of this decision has been proved time and again during the last 28 years when troops have been called out to disperse unlawful assemblies. During the Calcutta Bandh in 1966, one Gorkha battalion plus some odd ad-hoc companies, a total force of only a little over 1000 men was called out in aid of the civil power in that large metropolis. These troops dispersed several unlawful assemblies without once resorting to firing. The arrival of 'Olive Green' on the scene was a signal for violent mobs to disperse. The local newspapers were very appreciative of the role of the Army and one of them appropriately wrote. "Piffers patrol for peace".

ANTICIPATORY ACTION

As far as the Army is concerned, local commanders should always keep themselves in touch with the prevailing law and order situation in their area of responsibility. There should be no occasion for troops to be taken unawares nor should there be any delay in troops responding to a request for aid. Timely assistance rendered by a small force at the appropriate place may be of much greater help in restoring normalcy than the deployment of a much larger force at a later stage. This requires that local commanders must maintain close liaison with the appropriate civil authorities and should also utilise their own sources of intelligence to arrive at a correct assessment of the situation. On some occasions, anticipatory action may be necessary by the local military commander on his own initiative and without waiting for a requisition for aid from the civil authorities. In 1970, violence was apprehended in Imphal during the visit of the Head of the Government. The six-battalion brigade

deployed in Manipur was at that time fully committed in counter-insurgency operations in the hills and there were no troops located in Imphal. The local police authorities who had a force of over two thousand policemen deployed in the town were confident of dealing with the situation and were averse to the Army being brought into Imphal. However, the Brigade Commander on his own initiative but with the knowledge of the Chief Commissioner, concentrated two battalions in Imphal and had a third battalion and some armoured cars kept in readiness at short notice to move in, if required. This concentration of force took 48 hours to complete as troops had to be pulled out from picquets in the hills which were several hours march from road-heads. Troops were deployed in and around Imphal at various nodal points with specific orders that they should remain in hiding and not be seen on the streets until required. As anticipated, violence broke out in Imphal during the visit of the Head of the Government. Eleven police vehicles and some petrol pumps were burnt. Seven policemen were killed and a large number of policemen were injured. There was also an ambush outside Imphal in which a senior police officer was wounded. Civil authorities requisitioned military assistance and almost within fifteen minutes troops were out patrolling the city and enforcing Section 144. Several large unlawful assemblies were dispersed by troops during the next two days only with a threat to use force, instead of actually using force. Had anticipatory action not been taken and had the troops waited for requisition of aid, there would have been a delay of at least 48 hours and the situation in Imphal would have deteriorated considerably with very serious repercussions.

The legal position in regard to troops being called out needs to be emphasised. The magistrate of the highest rank present may requisition military aid and the military officer in command must respond. The latter cannot refuse to give aid but the action he takes in pursuance of meeting this requisition, is left to the sole discretion of the military officer and cannot in any way be dictated by the magistrate. The magistrate orders armed police contingents with him to open fire, should he think that this is necessary. In the case of the Army, the magistrate can only hand over the situation to the military commander and cannot issue orders for fire to be opened. This distinction needs to be carefully understood both by the magistrate and the military officer. The magistrate has, however, to decide when military assistance is no longer required. When he does so, the military officer in command should immediately cease further action, but he is still at liberty to take such action as he considers necessary for the safety of his troops. Although the spheres of responsibility of the magistrate and the military officer are clearly defined in law and neither is subordinate to the other, close co-operation between them

is essential to achieve the best results. In this connection, it is interesting to note that the Raghubar Dayal Enquiry Commission into the communal violence in Ranchi in 1966 adversely commented upon the action taken by both the civil and military officers concerned with the calling out of troops. The Commissioner of Ranchi Division requisitioned military assistance and the Sub Area Commander agreed to render aid, provided complete control was handed over to the Army. The Commissioner agreed to hand over control and then the troops were brought in. It was wrong of the Sub Area Commander to have insisted on this precondition and it was also wrong of the Commissioner to abdicate his authority. As stated earlier, the Army is required to aid the civil authority and not to replace it. The mechanics for dispersing an unlawful assembly in a specific local situation should not be applied to the administration of an entire town or a district.

GUIDING PRINCIPLES

Troops acting in aid of the civil power for restoring order must use military means and should not resort to non-military means like lathi charge, tear gas and so on. This implies that the soldier has to use his normal weapons. However, his action has to be governed by certain guiding principles which are amply described in our training manuals. These principles are, Minimum Force, Necessity, Impartiality and Good Faith. To illustrate the application of these principles, certain actual instances are recalled.

The principle of Minimum Force requires that normally single shots from the rifle and the least number of rounds should be fired. It does not, however, mean that automatic fire or fire with heavier weapons cannot be opened. The type and quantum of fire has to be related to the situation. In 1950 troops had to fire two 3-inch mortar bombs in Amritsar District to disperse an unlawful assembly. An armed gang had forcibly occupied evacuee land which had been allotted to refugees by the civil Government. The Deputy Commissioner requested for the dispersal of this gang which had entrenched itself in a village. As troops approached the village they were fired upon with automatics and 2-inch mortar bombs. In the circumstance, the use of 3-inch mortar against this unlawful assembly was fully in conformity with the principle of minimum force. This is, however, an extreme case and has been mentioned only to bring out the correct interpretation of minimum force. Normally controlled single shot fire from the rifle will be all that is necessary.

The principle of Necessity enjoins that every action should be preventive rather than punitive and there should be no reprisals. The barbaric 'crawling order' of Amritsar in 1921 was a flagrant violation of this principle and so indeed was Brigadier Dyer's plea of acting for effect

in his self-styled role of the "Saviour of the Empire" at Jalianwalabag. Acting in such a reprehensible manner, he only betrayed utter disregard for elementary canons of civilised and human conduct.

The principle of Impartiality is self-evident. Troops must not take sides during a disturbance. This principle is particularly important, during communal riots. In 1946 and early 1947, the erstwhile Indian Army gave an excellent example of observing this principle. In very difficult circumstances both Hindu and Muslim troops showed remarkable discipline and scrupulously observed this principle even when troops were operating in their home region, for example, troops of both communities in the Bihar Regiment during the Bihar riots of October 1946. After Independence, the Punjab Boundary Force comprising units of both Indian and Pakistan Army failed to display the same standard of impartiality and this soon led to the dissolution of that force. Fortunately, on numerous occasions since then whenever the Army has been called upon to act in this role, it has invariably displayed a rigid adherence to this principle.

The principle of Good Faith is supposed to be complied with automatically if the previous three principles are observed. However, no animus should even inadvertently be shown, like referring to the mob as enemy nor should temper be lost in any circumstance. A classic example of lack of good faith was again given by that infamous officer, Brigadier Dyer. He asserted that he stopped firing at Jalianwalabag, only when his ammunition ran out, otherwise he would have fired still more rounds. No wonder that even an imperialist Government found it embarrassing to shield him and his army career had to be terminated. He of course got away with his sins very lightly.

CO-OPERATION

In our training manuals emphasis is rightly laid on the need for ensuring co-operation with civil officials. There is, however, a need for elevating co-operation to the status of a guiding principle for aid to civil power and also adding a new dimension to it, in terms of ensuring co-operation with the people.

Troops called out in aid of the civil power must always strive to work in close co-operation with the local magistrates, the local police and the local people. The latter aspect requires elaboration. A spirit of co-operation with the local people should be built over a period of time. This process has to be continuous, starting from long before the actual employment of troops in aid of the civil power. Assistance to the local people from army medical resources, arranging of friendly sports fixtures with educational institutions, inviting selected elements of the local population to unit functions, parades and demonstrations will go a long way

to build the required rapport with the local people. This means that the Army should shed its tradition of exclusiveness inherited from its pre-47 traditions. It should not try to only live in the water-tight compartment of its cantonments. Contacts so built up, would yield rich dividends when troops are required to operate in this role. Support from the local people will always be of help in dealing with anti-social elements during widespread disturbances. Cadets of the National Cadet Corps can also be encouraged on a voluntary basis to play a positive role in restoring normalcy, particularly among the most volatile section of the people, namely students. In developing rapport with the local people, the Army, unlike the police, does not have any legacy of confrontation and conflict. However, this approach must be tried very judiciously and at no stage should an impression be conveyed of getting identified with any political group or party. One has not only to approach this problem from the right angle but one has also got to show that one is doing so. Village elders, respected gentry of the town or influential students, who are not actively connected with any political party, may be singled out for developing rapport.

In a status-conscious society where civil officials attach great importance to protocol, it is necessary that Army officers develop right relations with them. The relative status of senior civil servants are generally well defined in the tables of precedence issued periodically by the Government of India since Independence and on the basis of their emoluments. In the case of relatively junior civil servants like Deputy Commissioner, Sub-Divisional Officer and other Magistrates the position is a little vague and sometimes leads to avoidable misunderstandings. Those who in this context argue in terms of supremacy of the civil authority in a democracy or in terms of a Deputy Commissioner being the head of the district, only betray their ignorance. Supremacy of the civil authority in a democracy stands for the supremacy of the political executives and it does not by any stretch imply any inflated status for a civil servant. Similarly, the colonial concept of a bureaucrat in frock coat and white hat representing the King Emperor and being regarded as the head of the district, has no relevance in modern India. In our democratic set-up the Deputy Commissioner can at best be considered the first public servant of the district and not the head of the district. For ceremonial purposes, the latter function should be performed by an elected representative of the people—be he a Minister, a Mayor, an MP, an MLA or a Chairman of the Municipality/District Board. This only conforms to the practice in vogue in other democratic countries.

RELATIVE STATUS

Reverting to the question of the relative status of the Deputy Commissioner, it may be mentioned that even in the colonial administration

of the pre-47 era when the bureaucracy had an inflated status, inside his District the Deputy Commissioner generally ranked with Lieutenant Colonels and was junior to the latter, outside his district. After Independence, the Government of India has not issued any table of precedence governing the status of Deputy Commissioners but in 1966, it advised State Governments to use the pre-47 equation as a guide. Notwithstanding this, State Governments have approached this problem in different ways. Some have elevated the status of a Deputy Commissioner to a higher place than even a Brigadier. The best approach for Army officers in dealing with Deputy Commissioners or other Magistrates whose relative status with military ranks varies from State to State, is not to worry about the State Tables of Precedence which in any case are only for ceremonial and not functional purposes. Without in any way accepting a subservient position on the basis of any mistaken notions of relative status, army officers should always show them due courtesy and consideration. The age of the individuals concerned can be a good guide in their mutual relations. There is no reason why a Deputy Commissioner with only five years service in the IAS and who is only 30 years old should not be treated at par with say a Captain or a Major. On the other hand an older Deputy Commissioner who is 45 years old can be treated at par with Colonels or Lieutenant Colonels and shown due regard by younger Army officers. Deputy Commissioners in the latter category would invariably be promoted officers and not those directly recruited to the IAS. However, this does not matter because even in the Army we show greater consideration on the basis of age to an old Captain or Major promoted from the ranks than a young Captain or Major who has been directly recruited as an officer. The suggestion to use the age formula as the basis for developing correct relations between civil and military officers is only in accordance with Indian traditions. In our society, due consideration is always required to be shown for an individual's age.

Relations with Police officers should also be guided on the basis of the age formula. However, in regard to the police there are certain aspects which deserve special mention. First, since calling out of the Army is generally in the wake of the Police not being able to cope with the situation, there is sometimes a tendency on the part of Army officers to adopt an air of superiority. This is totally uncalled for. The responsibilities of the police are very onerous and its tasks very difficult. A situation going beyond its control should not be viewed as an instance of its failure. It should be regarded as a case of violence of greater dimension, requiring more drastic measures. Secondly, when troops operate in aid of the civil power, policemen in that area do not come under command of the Army. Their co-operation should be enlisted tactfully but no attempt should be made to order them around. Lastly, police officers wear very similar badges of rank as Army officers but

they are police badges of rank and cannot be used as the basis for equation with the Army. Pre-47, a Superintendent of Police with less than 15 years service in IPS was equated with a Captain and those with more than 15 years service with a Major. The Government has so far not changed this equation even though Superintendents of police with only 5 years service have begun to wear badges of rank which happen to be of a similar pattern as that of a Lieutenant Colonel. The relative status of senior police and Army ranks has been fixed by the Government of India-the IG Police stands equated with Major-General. However, the relative status of police ranks below IG Police has not been fixed, except for what was in vogue pre-47. Here again the application of the age formula rather than what is worn on the shoulder may provide a useful guide for developing healthy relations between Army and police officers.

TRAINING.

To derive maximum benefit from the employment of troops in aid of the civil power, it is necessary that different Government agencies involved in this task are given training at periodic intervals. So far as the Army is concerned, this subject is included in the training syllabi of different training institutions like Indian Military Academy, College of Combat and the Staff College. Besides this, training is also required to be carried out in this subject in field formations and units. On the civil side, an odd lecture on this subject is given to IAS and IPS cadets when they join service but thereafter no organised training is provided.

Both Army and civil officers need to be given joint training in this subject. In 1965 a week's cadre was organised in Calcutta for a large number of Deputy Commissioners and Superintendents of Police of West Bengal along with Lieutenant Colonels/Majors. These officers were addressed by senior Army, civil and police officers on different aspects of aid to civil power affecting their respective service. They also discussed these aspects amongst themselves in joint syndicates. Demonstrations on the functioning of a joint Operations Room and the dispersal of an unlawful assembly were organised. A playlet bringing out salient points of such duties was also staged. The cadre culminated in a sand model discussion attended by composite syndicates of Army, civil and police officers. Such a cadre has obvious advantages and should become a regular annual feature in States.

CONCLUSION

As far as possible, State Governments should tackle law and order problems with their police forces assisted where necessary by Central

police forces. With the considerably increased strength of armed police units both at the Centre and in the States, the Army should be rarely called out in aid of the civil power. This would ensure greater credibility for the Army as a deterrent. When troops are called out, they would be able to restore the situation by adopting less drastic measures. However, so far as the Army is concerned, it should at all times be prepared to promptly respond to any call made for aid to the civil power. The use of the Army in this role is the last resort of the Government to maintain order. The Army cannot, therefore, afford to fail in carrying out this task when called upon to do so.

The action of troops acting in aid of the civil power should be based on the guiding principles of Minimum Force, Necessity, Impartiality, Good Faith and Co-operation. A new dimension to Co-operation can be developed in terms of establishing rapport with the local people. This should be a continuous process starting from well before the onset of any trouble requiring military aid.

Army officers employed for these duties must show tact and develop understanding with the civil officials with whom they have to function. The appreciation of each other's points of view and due regard for age are a better basis for developing healthy relations than any mistaken notions of relative status or responsibilities. There is of course no functional subordination of one to the other; the two must work in close co-operation and harmony to achieve the common goal of restoring normalcy in the quickest time, with least casualty or inconvenience to our people.

AEROSPACE INDUSTRY IN THE EIGHTIES AND BEYOND

SQUADRON LEADER K.S. TRIPATHI

STARTING from the V-1 and V-2 German weapons during the closing years of the Second World War, the aerospace industry saw its golden age in the 1960s. But hardly had the sixties passed than the industry in the West plunged into its worst period of adversity since the 1940s. As it faced a succession of new problems in a changing and generally hostile environment, it soon became apparent that a great vacuum was developing in industry leadership and that the industry was drifting aimlessly. In 1969-70 massive unemployment overtook a large number of American aerospace scientists and engineers, who were suddenly thrown out of jobs. A tightening financial squeeze threw out of gear all but a few aerospace projects. Many firms engaged in aerospace projects were beginning to pull their shutters down and to diversify their efforts to more lucrative business.

The crisis, even though serious, did not last long. Before any irreparable damage could be done, new leadership emerged to give the much-needed fillip. The American Institute of Aeronautics and Astronautics (AIAA), which was formed in 1963 by a merger of the Institute of Aeronautical Sciences and the American Rocket Society, came to the rescue of the aerospace industry by providing effective and perceptive leadership in various fields. First, the AIAA addressed itself to the urgent task of providing employment to the scientists and technicians. It organised several employment workshops for over 40,000 technical personnel out of which over 12,000 succeeded in getting suitable jobs. Continuous efforts were made to provide employment to others through an extensive liaison network.

The AIAA moved speedily into creating a greater public awareness among the legislators who determined national policies and budgeting. Recently it organised an effective dialogue on technology between the industry and the government under the leadership of Edgar Cortright of NASA and Lt. Gen. James Stewart, the Commander of the Aeronautical Systems Division, USAF. The AIAA is deeply conscious of the youth of the country and rightly feels that unless the talent of the youth is harnessed to aerospace technology, the industry would have little scope of further development. In pursuance of this policy, the AIAA entered the academic field and initiated discussions and debates on current

aerospace problems. However, the most important area into which AIAA has moved is the leadership vacuum in the vital field of exports. Expanded exports have become vital to both the US aerospace industry and the national economy's fight against a trade deficit and the AIAA has emerged as a dynamic catalyst to find new markets in China, the USSR and the East European countries. AIAA's tremendous success in building a aerospace trade bridge to the USSR with its Moscow exhibition in July, 1973 was a spectacular demonstration of what a dynamic and determined organisation can achieve.

During the past few years the AIAA has undergone a metamorphosis from an aloof, professionally introverted organisation into a vital force of leadership for the aerospace industry both domestically and on the international scene.

R&D Boost

Both the Soviet Union and the United States are today concentrating on Research and Development programmes with a view to producing a new generation of weapons in the 1980s. The competition between the two super powers is once more becoming so fierce that a new arms race is emerging which may make detente and SALT meaningless. According to the Stockholm International Peace Research Institute the Soviet Union spends nearly \$10 billion a year on R&D. U.S. experts, on the other hand, believe that the current Soviet expenditure under this head is to the order of \$16 billion to \$20 billion a year. The Soviet Union has also considerably augmented its technical forces working for defence projects. In 1960 there were, according to American sources, 225,000 Soviet research scientists and engineers. Today the Soviet Union has some 625,000 personnel in these cadres. It is not known what percentage of this force is working on defence projects but considering that the Soviet Union has a wide spectrum of R&D projects, a fairly large number of scientists may be working in defence laboratories. In 1960 there were 400,000 scientists in the US but their number has gone up only by 150,000 in a decade and a half. Concerted efforts are, however, afoot to enroll more scientists in the aerospace industry. The United States proposes to spend \$8.1 billion on R&D in 1974 and \$9.4 billion in 1975.

Addressing the West Point Societies of Ohio last year, Gen George S. Brown, Commander of the USAF Systems Command, lamented the growing public apathy towards the military tradition and said, "The present very visible build-up and modernisation of Soviet forces, strategic, tactical, logistical, nuclear and conventional derive from research and development that was being carried out five to 10 years ago where the United States was clearly superior in those technological areas. Today, however, the USSR is spending far more than we in money, in technical

manpower, in scientific and engineering education, in every phase of R&D. That great momentum, as contrasted with our own fairly static posture in defence-related R&D is what will give birth to the Soviet weapons of five, 10, and 15 years from now." Gen Brown's statement is important for the succinct summing up of R&D programmes in the two countries.

SOVIET UNION LEADS

The Soviet Union has planned its aerospace technology on a sound footing and is pursuing its pre-determined goals with remarkable tenacity of purpose. In the 1960s when the United States turned out just one aircraft, the problem-ridden F-111, the Soviet Union dazzled the world by producing some ten new fighters.* The Soviet Union's Foxbat, MIG-25 is the world's fastest interceptor today and according to the editor of *Janes All the world's Aircraft*, it is doubtful if United States' latest Naval interceptor, the F-14 Tomcat, will be able to match the MIG-25@. The USA is, however, developing another fighter the F-15, for the Air Force.

The Soviet Union has also an edge in anti-aircraft missiles. Its air defences have some 10,000 launchers, including the deadly SA-6, which took a heavy toll of Israeli aircraft during the 1973 Arab Israeli War. It was the devastating accuracy of the SA-6 which was primarily responsible for turning the tide of the war in favour of the Arabs and blunting the Israeli air attacks, which in the past were mainly responsible for Israeli success.

The Soviet designers have taken a lead in experimenting with hypersonic vehicles powered by scramjet propulsion systems and capable of operating in the Mach 5 and Mach 7 speed region. Hypersonic aircraft are the vehicles of the future and are not likely to be operational before 1990s. The United States is also commencing experiments on hypersonic aircraft, which may be deployed for active service by the year 2000 or later. As regards space vehicles, the Soviet Union is not developing an equivalent of the US space shuttle, but may do so later when it deploys space stations which may accommodate from six to eighteen crew members. The Soviet Union is also not planning any manned moon landings at present but has kept her options open and may launch on a moon programme towards the end of the century.

The Soviet Union has placed a highly advanced, enlarged, 150-passenger supersonic transport (SST) in full series production and is already developing a larger, longer-range, second generation supersonic transport. In the process, the soviet metallurgists have developed extensive and highly competent Titanium-processing capabilities and have brought down the cost of this militarily important metal by some 300 per cent during the five years. This obviously is the most noteworthy

* See author's article "Current Trends in Military Aviation", IAF Quarterly, Summer 1968.

@ See author's article "Aircraft Industry in the Seventies", USI Journal of India, Jul-Sep 73.

achievement of the Soviet aerospace industry in recent years. This revolutionary process was developed by the Research Institute for Aircraft Manufacturing Methods (NEAT) in Moscow. It is one of the 12 special Aerospace Research Institutes in the Moscow area doing fundamental research and development in major segments of the technical spectrum.

Details of the manufacturing methods of the TU-144 were revealed for the first time to Western journalists during a ten-day tour of the Soviet aerospace facilities, arranged by the USSR's Navosti Press Agency and the Soviet Ministry of Aircraft Industry in June 1973. By far the most surprising discovery of the US aerospace writers was the fact that the Soviet SST is in full-scale production at Voronezh, that the production facilities are extremely modern and highly automated, and that a major expansion programme, which will double the capacity of the plant, is in progress.

The Koliesov Engine Design Bureau, whose existence had not been previously known in the West, is developing an alternative engine to the Kuznetsov NK-144, the 44,000 pound thrust power-plant that is used on current models of the TU-144 and according to western intelligence experts, on the new "Backfire" strategic bomber. The Koliesov engine is a variable geometry, variable bypass-ratio engine that functions as a straight turbojet at supersonic flight and as a turbofan in the subsonic regime. It is worth noting that no such advanced design exists in the West at present.

GIANT AIRCRAFT

The achievements of the Soviet Union in various fields of aerospace industry are indeed, outstanding. It is remarkable that the Soviet Union has not only the fastest fighter, the Foxbat MIG-25, the fastest bomber, the Backfire, the fastest SST, the TU 144, but she has also the biggest anti-submarine aircraft or for that matter the largest aircraft in the world. Now being tested over the Caspian sea, the aircraft weighs about 500 tons and is another awe-inspiring example of the Soviet Union's improving military technology. The aircraft is so big that it has two sets of wings—one forward, the stub wing, which is 40 ft. long and the other, the main wing, which is 125 ft. There are ten turbojet engines—eight mounted on the stubby forward wings and two on each side of the empennage just below the V tail. The Soviet design employs a revolutionary principle: the jet blast from the eight turbojet engines mounted on the forward wing is deflected downwards to hit the water and bounce back under the main wing on take off to create a lifting bubble of air similar to that on which Hovercraft ride. After take off, the thrust is re-deflected over the top of the wing to create additional aerodynamic lift. When fully developed in the late 1970s, this monster will thunder along at speeds upto 350 m.p.h., flying only 25 to 50 feet

above the water low enough to make radar detection difficult. The aircraft has an enormous range and is capable of flying non-stop for two to three days extending as far as 7000 miles. Loaded with gear and used both for military and anti-submarine warfare, the aircraft would give the Soviet Union a new and ominous means of hunting the US Polaris/Poseidon and Trident submarines as they cruise in the silent depths of the high seas.

In the field of ICBMs also, the Soviet Union has achieved such notable success of late that many American defence experts feel that a second "missile-gap" is overtaking the United States. The Soviet Union is currently conducting MIRV tests of its latest ICBM, the SS-19, in the Pacific and before the tests were concluded in March 1974, the Soviet Union had not only considerably improved the complex system of multiple nuclear warheads aimed at separate targets but had, according to some experts, also overtaken the USA in the field of nuclear armament.

U.S. HYPERSONIC AIRCRAFT BY 2000

The Soviet Union has taken the initiative in hypersonic manned aircraft development, but the U.S. engine technology in the turbo/ram-jet-supersonic ramjet (seramjet) field is at present at a standstill. Some preliminary studies have been conducted by the USAF and the American industry in the past several years, and the results support hypersonic weapons systems, including :

- (a) Advanced manned interceptor.
- (b) Surface-launched interceptor missile (SLIM), a Rockwell International study using the Boeing COM-10A missile with a hypersonic engine for Mach 4-6 speeds with an infrared/radar dual-mode guidance system. Garrett Air Research has completed initial studies with a liquid oxygen-fueled hypersonic engine that could be adapted for SLIM.
- (c) Advanced tactical fighter to operate at speeds over Mach 2 but under Mach 4. McDonnell Douglas has completed a study contract and preliminary design concept of their craft. The Tactical Air Command has the parametric design, mission profiles, including speed ranges, altitudes, effects of loads on gross weight, dash speed and range, and it is validating a required operations concept. The advanced tactical fighter will be used principally as an interdiction aircraft by USAF and is intended for production in the 1980s. Since weapons delivery is the key to the future of the advanced tactical fighter for air-to-ground interdiction, the aircraft is projected

to fly against more sophisticated threats than the Fairchild A-10A is designed to handle. In the initial stages the aircraft was designed to carry only one pilot but the subsequent design may have place for another crewman for weapons control.

The US Air Force is due to begin wind tunnel test with experimental hypersonic aircraft at Wright-Patterson AFB's Flight Dynamics Laboratory to speeds up to Mach 5. Further tests are planned later at speeds up to Mach 10 in the wind tunnel at Arnold Engineering Development Centre, Tullahoma, Tenn. but since a highly advanced and complex aero-engines and aeroframes technology has to be developed, it is doubtful if any U.S. hypersonic aircraft can become operational before the year 2000. In a three-pronged approach to developing technology for advanced high-speed aircraft, the Air Force envisages a joint effort with the National Aeronautics and Space Administration. The Air Force's three approaches to across-the-board advancements in high-speed technology are :

- (a) *Incremental growth vehicle (IGV)* : This vehicle will be a technology demonstrator suggestive of a hybrid aircraft-aerospace vehicle-design to define mission potential. The IGV, a proposed aerodynamic flight research vehicle, would have a common structural core and subsystems for advanced technology demonstration in regimes of Mach 4 to 10.
- (b) *Dedicated Technology Demonstrator (DTD)* : This aircraft will be designed for sustained cruise flight in the Mach 3-6 regimes. Aside from data derived from dash speed flights with the North American X-15, the U.S. Air Force believes that a void exists in technology and that there was an imperative need to focus attention on this area in aircraft design. McDonnell Douglas has completed preliminary design work of the demonstrator concept and a one-sixteenth scale model was tested recently in the wind tunnel.
- (c) *Manned lifting bodies* : These include both a growth version of Martin Marietta's X-24B and an X-24C. Preliminary conceptual designs for applications have already been submitted to the Air Force by the company. This is a low-cost approach by the service and NASA, taking advantage of the X-24's low aspect ratio delta wing and using as much of the present X-24 vehicle as possible for modifications and flight testing.

The United States Air Force is convinced that it must team with NASA for development in the high-speed regimes, particularly in the Mach 4-6 area for military applications, if it is to obtain funds for technology development. The U.S. can not afford separate research vehicles

in the hypersonic areas and since NASA is keenly interested in developing hydrogen-fueled supersonic combustion ramjet engines for manned hypersonic aircraft and recoverable space vehicles, it is natural that the USAF and NASA worked together. Design criteria for aircraft to fly in the high speed regimes will be a major step, according to the USAF. Propulsion, materials, structures and various component advanced development programmes have provided important data in areas of hypersonic flight. What is needed now for continued development is integration of these developments into manned vehicles for demonstration above Mach 3.5, particularly in the Mach 5-6 area.

To achieve and maintain high-Mach cruise speeds, the IGV will employ a mother ship to carry it aloft and drop it for rocket boost and sustainer engine takeover. The IGV would be carried initially by the Boeing B-52. The Air Force has selected McDonnell Douglas for the IGV programme because of its advance work on an orbital re-entry vehicle. The work was planned in steps, from subsonic to orbital speed using a hypersonic test vehicle philosophy similar to that of the USAF with its IGV. The baseline engine planned for use in the high Mach regimes is the United Aircraft/Pratt & Whitney HL 10 rocket motor designed for the General Dynamics Centaur. The IGV will be used for :

- (a) Hypersonic air breathing propulsion experiments.
- (b) Testing representative hypersonic structure design using super alloys and refractory metals.
- (c) Proving the platform configuration suitable for hypersonic operations cruise speeds.
- (d) Determining the effects of heat radiation and a regeneratively cooled structure.
- (e) Operational experiments with hydrogen fuels.

The dedicated technology demonstrator (DTD) vehicle would have applications as an attack aircraft in the Mach 4.5 range. It is designed to use turbojets and ramjets, while the other two aircraft will use combined cycle engines. In addition to USAF applications, the design incorporates deck launch technology for the use of the Navy aircraft carriers. The three Air Force approaches offer a variety of options, but not all are likely to be used. The USAF believes that the DTD could provide the U.S. aviation leadership in the 1990s and the first decade of 2000, if funds could be obtained for its construction. The aircraft would be fabricated with titanium and according to technical experts it would be the lightest way to develop a high-competence aircraft at low cost. A ramjet engine for operational use is about 10 years away from development, but signifi-

cant tests could be accomplished with turbojets in the DTD. It is estimated that the prototype cost of the experimental vehicle will be about \$250 million for three aircraft, including ramjet development. It is also estimated by USAF that four to five years will be required for a flight rated ramjet for a test aircraft. A small integrated turbo ramjet propulsion package could be developed for about \$50 million, officials estimated.

ADVANCED SUPERSONIC TECHNOLOGY IN 1980s & 1990s

Advanced Supersonic Technology (AST) programme, which the National Aeronautics and Space Administration hopes will provide the data necessary for the U.S. to compete with Soviet and European civil aircraft producers during the rest of this century, including work on propulsion, materials, ecology, controls and aerodynamics, is focusing on three concepts of varying degrees of complexity. The goal of the AST, according to NASA officials, is not to design any particular type of supersonic aircraft-fighter, bomber or transport-but to "keep the technological power dry" so that the USA could have the continuing capability of producing advanced supersonic aircraft of any type. The three concepts on which the AST programme has settled are :

- (a) *Near-term supersonic transport concept.* This is basically a continuing refinement of the basic Scat 15F design, from which came the original arrow wing concept, Near-term, in this case, is used by NASA to define the amount of work necessary to permit the start of development of such an aircraft, rather than in a chronological sense. Originally, NASA expected to have the near-term concept data ready by the mid-1970s, with 1976 or 1977 being mentioned as the dates by which a policy decision on aircraft development could be made, but now this decision date has slipped at least until the early 1980s and it is extremely unlikely if US supersonic transport aircraft would be able to enter airline service before 1990.
- (c) *Intermediate Configuration.* This is an advanced variable-geometry supersonic aircraft employing such concepts as a hard stability augmentation system (HSAS) in order to compensate for low-speed instability.
- (c) *Long-term configuration :* It is an idealized supersonic transport with long-range, an advanced propulsion/control system, the ability to operate overland without creating a disturbing sonic boom, and embodying advanced materials, materials processes and structures methodology in order to permit the use of a blended wing/fuselage design. The first wind tunnel model for such a vehicle now is under construction but development

of this concept is a long-term project, at least 15-20 years away according to A. Warner Robins, head of the supersonic mechanics section of Langley's full-scale research division.

These concept-configuration-studies are only one phase of the total AST programme, but they tend to bring into focus the status of technology today and the advances required before aircraft development could begin. The total AST programme consists of five areas of research, including : propulsion, stratospheric emission impact, structures and materials, stability and controls and aerodynamics performance.

The ultimate supersonic aircraft concept, NASA now believe, will be an advanced version of the arrow wing concept. AST researchers hope to be able to go into considerable depth in determining the best design and structural arrangement for an aircraft that would operate at speeds up to Mach 2.7, getting into such things as the structural arrangement (for example, spar locations), structural parameters (such as wing thickness) and materials and manufacturing processes (such as the relative merits in different situations of aluminium, titanium, and various composites). A similar design profile for a Mach 3.2 aircraft then could be done in somewhat less detail.

AMERICAN TACTICAL FORCE OF THE FUTURE

By 1975 the USAF is likely to make procurement decisions which will provide it a manned tactical aircraft force structure for the 1980s. McDonnell Douglas F-15 air-superiority fighter, Fairchild Industries A-1CA close-support aircraft and light-weight fighters will comprise the 1980s tactical Air Force of the United States.

Two lightweight fighter prototypes are under construction now by General Dynamics and Northrop. Both are being supervised for the Air Force by the Aeronautical Systems Div. prototyping office. The General Dynamics aircraft, powered by a single Pratt & Whitney F-100 engine, developed for the F-15, was test flown recently. The Northrop fighter will carry two General Electric YJ101 turbojet engines and is likely to be tested in flight by April 1974. The roles and missions in the force structure would place the lightweight fighter at forward airfields near the battle area in a defensive aircombat role to provide fast reaction to attacking enemy aircraft. The Air Force is planning to use Boeing Co. 707 transports reconfigured as E-3As for airborne warning and control system (AWACS) aircraft to work with pilots of lightweight fighters, which will provide fast reaction in areas where speed and high manoeuvres are of prime concern in the dogfight arena. The AWACS is being developed by Boeing under an estimated \$2.39 billion USAF contract that calls for four test-bed aircraft with contract options. Long-range plans call for 42 aircraft, with the first production unit to be delivered in November

1976, and introduction into the inventory starting in March, 1977. Using electronic equipment for finding and tracking enemy fighters, the AWACS could also furnish control for US fighters as well as the close-support Fairchild A-10A aircraft for battlefield interdiction.

The Air Force planners envisage the F-15 stationed in more-remote, relatively secure areas for use in offensive air combat. In-flight refuelling, en route to the air combat area, is also considered a possibility. The F-15 avionics system has a long range and TV display, flight instruments, UHF communications and radio navigation equipment, central digital computer and an automatic test system. The F-15 is armed with three weapons :—

- (a) The internal-mounted M-61 gatling-type Vulcan gun.
- (b) An advanced Philco-Ford Sidewinder Missile (AIM-9L) installed on the wing stations of dogfight capability.
- (c) The AIM-7F advanced Raytheon Sparrow, carried on the lower corners of the fuselage for low drag.

A-10/A-7

As regards A-10 the Senate Armed Services Committee wants a competitive flyoff between the LTV Aerospace A-7D and the Fairchild A-10A to determine which aircraft will become the principal Air Force close-support vehicle. The A-10A and A-7D have approximately the same gross weight, but the former's larger unswept wing provides it substantially better loiter time and the capability of operating from short runways. On the other hand, the Fairchild prototype has a maximum speed of only 350 kt. as compared with 610kt. for the A-7. USAF hopes to boost the maximum speed of the A-10 to 390kt. The A-7D also incorporates an advanced heads-up navigation and attack display as compared with the relatively simple avionics package to be used by the A-10A. Proponents of the latter maintain that its low speed and manoeuvrability characteristics preclude the need for a more advanced and more expensive system, but the Senate committee believes that one may be necessary. The A-7D has the advantage of an impressive combat record in South-east Asia, flying 6,500 sorties with only two combat losses. Mission abortive rate was less than 1%. The aircraft required only 16.5 maintenance manhours per flight hour. Forward air controllers reported an average miss distance for A-7 strikes of about 35 ft.

USAF officials however testified before the Armed Services tactical air subcommittee in March 1973 that a cost-effectiveness study, known as Saber Armor Charlie, had demonstrated the superiority of the A-10A over the A-7D as a close-support aircraft.

THE COMMITTED SOLDIER

BRIGADIER NB GRANT

SINCE the publication of the Third Pay Commission's report, a controversy has been raging over the attributes of the 'generalist' and the 'specialist' for executive appointments in the government, whether in the public industry, the civil services or even the military. Further, since the passing of the 24th amendment to the Constitution, controversy had also started in respect of a new category of government servant, namely the 'ideologist', more commonly referred to as 'committed'. Although in the past, a lot has been written and discussed regarding the merits of the generalist vs the specialist, it is only recently that the controversy regarding the 'ideologist' has come to the forefront. The aim of this paper is to analyse this latest species, in its applicability to government services in general, and to the armed forces in particular.

CONCEPT OF COMMITMENT

Addressing the heads of the public sector undertakings, the Prime Minister observed—

"All these years we have taken up important programmes publicly, but we have put at the head of these undertakings men who were not fully involved, but thought it was only another job. We cannot simply afford that sort of attitude."

She desired that all those who were concerned with any sort of public service should be "deeply involved, deeply committed". Wrongly or rightly, these views have given rise to yet another controversy, because it was thought that the government desired to politicize all its services. On this issue the question, which has been raised in many quarters, is with regard to the basic concept of the desirability of government services getting involved or committed to any form of political ideology. In this respect, it was argued that, in our type of democracy which has been fashioned after the British and American pattern, it was essential that the Civil Services and the Armed Forces stay completely aloof, and do not get themselves involved in any way in the political ideology of the government in power.

Upto now, the concept has always been that, whereas the civil servant was committed to the high principles of public good as embodied in the Constitution and to the Directive Principles of State Policy, namely

promotion of justice—social, economic and political—the soldier's commitment has always been as interpreted in terms of Lord Chetwood's inscription at the IMA, namely, that he is committed first to the security and welfare of his country, committed next to the security and welfare of his men, and committed last to his own security and interest.

Although the above concepts appeared to have worked under a colonial domination, and was aptly suited to the purely professional aspect of the Services, the question arises, whether under the present environment in the country, emphasising social justice in its true sense, is it possible for any government servant, civil or military, to remain divorced from the political ideology of the government in power?

IDEOLOGICAL ASPECT

The above problem becomes more complex in a developing country like India than in a developed country like USA or Britain. In the latter countries, their industrial revolution preceded their political aspirations, and therefore everything was geared towards higher production, and productivity and professional efficiency was the hall mark of the Services. In those countries, therefore, political ideology took a very low priority in comparison to the other facets of its national life. In our country, however, possibly due to circumstances beyond our control, the opposite has happened, in that, our political awakening preceded our industrial rejuvenation, with the result, that right from the start, political ideology has dominated and taken priority over such 'mundane' professional activities like higher production and administrative efficiency. This trend is still continuing, and if anything, the ideological aspect is gaining more prominence over the purely professional considerations.

This being the case, the question arises, whether the professional civil servant or for that matter the professional soldier, can afford still to stay aloof, or should he get himself absorbed and become a part of that ideology. To do otherwise would mean being at conflict with the socio-economic climate of the country, and which must ultimately result in a lowering of his professional effectiveness. On the other hand, swimming with the existing ideological current, would mean being at variance with certain professional and administrative traditions to which the Indian civil servant and the soldier have been wedded to. In communist countries like Russia and China, it is incumbent on the civil servant and the soldier to be thoroughly indoctrinated and be imbibed with the party ideology. On the other hand, the civil servant as well as the soldier in democratic countries like Britain and America, is wedded respectively to the idea of commitment to the country and the Constitution, without these being related to the ideology of the government in power. The crux of the matter, however, is that neither one or the other system has had

any adverse effect on the professional skill of the individual or the administrative efficiency of the organisation. Unfortunately in our country, we have been caught between these two extremes, resulting in some misunderstanding and to a certain extent lack of faith, between the government and its services. What is then the answer?

THE DEGREE OF COMMITMENT

Depending on the degree of commitment or opposition to a particular ideology, all executives whether in the civil service or the armed forces, can be divided into the following categories—

- (a) *Crusaders* : Hundred per cent committed, and ready to stake everything, including life and livelihood, for the sake of success of ideology or policy.
- (b) *Sympathisers* : Generally believed in the ideology or policy but may have some reservations. Also not willing to take extraordinary risks. May at times even prefer to conceal their faith.
- (c) *Neutrals* : Have no ideological axe to grind. Willing to do any job assigned to the best of their ability to make their own career. Successful mainly in respect to power and money.
- (d) *Conscientious Objectors* : Have no faith in the ideology but would prefer to do jobs selectively. May create difficulties at times by withholding efforts, but would desist from wrecking efforts of others.
- (e) *Antagonists* : Openly opposed to the ideology. Would attempt to secure rejection of the ideology in preference to the alternative one, but such efforts are constitutional.
- (f) *Saboteurs* : Deadily opposed to the ideology. May express interest and even participate in programmes outwardly with a view to sabotaging.

Whether it be a civil servant or a soldier, democracy presupposes only such citizens, who make a comparative study of ideologies of different political parties, and support one or the other on the basis of convictions formed. It is a great irony that our school and college curricula both in the military and the civil (except those of economics and political science) do not include detailed study of principal ideologies resulting in 'educated' people remaining 'uneducated' in this vital sphere.

CONCLUSION

Let's face it, whether we like it or not, the political system and its ideologies have now become a part of our daily living and the environment in which we work. It has permeated into almost all facts of our professional and cultural life, and we can no longer pretend to remain outside this system and yet be effective as we have managed to do in the past.

In this respect however it can be stated that—

- (a) full commitment to the ideology of the government in power is not a necessary qualification either for a civil servant or the soldier ;
- (b) any party or its government would, and there is no reason whatsoever why they should not, scrupulously bar entry of antagonists and saboteurs to high offices, whether it be in the civil or the military, and avoid conscientious objectors as far as possible ;
- (c) in the type of multi-party democracy adopted by us, 'neutrals' should still be preferable, though other things being equal, 'sympathisers' would do better.

It is realised that, the above concepts may disturb a hornet's nest. However by now it must also be apparent that, the Services are today in the midst of this nest which has already been disturbed. If they do not wish to be stung, they will have to learn to live with the system and be 'committed' to it. Whether today the armed forces are mentally prepared to accept this, is a different matter.

The following works were consulted in the preparation of this paper—

- (a) Choosing Chief Executive for Govt Undertakings —SS Patil
- (b) Role of Civil Service in Administration —BS Nokra
- (c) Soviet Management —Barry M Rickman

STRUCTURING THE ARMY FOR IMPROVE DEFFECTIVENESS

BRIGADIER V NAGABHUSHAN, BSC, BE, MIE(I), PsCT, ADMG, NDC.

INTRODUCTION

THE effectiveness of an organisation depends on a number of concomitant factors of which the organisational structure is an important one. It is important because it is an attempt at delineating authority and responsibility—authority to commit resources, direct execution and take decisions, and responsibility to achieve tasks designed towards realisation of organisational goals. Since achievement of goals is a direct function of the effective use of resources, the way the resources are husbanded has a direct bearing on the degree of effectiveness of the organisation.

Formal organisational structures are normally hierarchical in character and exhibit four fundamental characteristics—task specialisation, unity of direction, chain of command and span of control. An examination of these four characteristics reveals that each flows from the other and the basic building block is task specialisation.

The term 'specialisation' connotes a degree of expertise in a narrow functional field. Such specialisation is dependent upon the complexity of resources and tasks of an organisation. Many of the functions are inter-related and these relationships alter with the nature of the task. Hence unity of direction and chain of command are to be determined on the degree of functional specialisation of task groups as also the nature of the overall task itself, which needs unity of direction. In this modern age, 'specialisation' in almost all fields is taking on new and narrower meanings. While 'mechanical engineering' was a specialisation over a decade or two ago, today it connotes a family of specialised disciplines—each distinct and clearly discernible. Hence, an organisation dealing with Mechanical engineering in the earlier days has had to restructure itself to ensure that 'task—specialisation'—and "unity of direction" are given the new interpretation and orientation dictated by the modern technological environment, if it has to remain effective.

From the foregoing it is apparent that, though the four characteristics are fundamental to any organisational structure, their interpretation and consequent application are subject to constant change, the pace of changing connotations depending upon the pace of change in the envi-

ronment, both external and internal, within which the organisation has to operate.

'National Security' is a vital goal of all nations; for, 'without secure environs no nation can live and develop according to its genius'. The parameters of 'security' are very sensitive to environment and therefore are very dynamic. The structure for national security should therefore take into consideration the need for periodic appraisal of the dominant characteristics of the environment for national security and reinterpret its own characteristics in its light. It is only in this way can one ensure a high degree of effectiveness of the national security structure at all times.

The Army is but one limb of the national security structure. To consider its structure in isolation may mean 'sub-optimisation'. Nevertheless, it is felt that suboptimisation in this field would be of immense help in indicating some lines on which reappraisals could be made. Also, being a 'system' in its own right, it is quite amenable to being studied in isolation and any guidelines obtained could be implemented with advantage without having to await a study of the complex system of national security as a whole.

The external environment which has a profound bearing on the effectiveness of the national security structure (and consequently on the structure of the Army) is the one created by the technological explosion of the twentieth century. This has affected not only the interpretation of the term 'task specialisation' but has also produced secondary effects in the sociological field. This paper will therefore try to analyse the effects of the technological environment on the organisational structure of the Army and involve a suitable framework which would be more in tune with this dynamic environment.

EFFECTS OF THE TECHNOLOGICAL ENVIRONMENT

The phenomenal expansion of technology in the twentieth century has been too well documented to bear repetition. Suffice to say that it has provided the arsenals of nations with a plethora of sophisticated weapons and weapon-systems. These have profoundly effected the nature and manner of warfare. The complexity of modern warfare can only be mastered by personnel who understand, interpret, and utilize the technological environment to advantage.

The soldier of today cannot afford to be a mere 'foot-slogger'. Modern technology has enlarged the scope of his senses—senses of seeing and hearing especially, increased the 'reach' of his arms and given him the ability to move fast over varied terrain. Such advantages have

accrued not only to groups of soldiers but also to the individual soldier as well. If he has to exploit these advantages fully, he has first to learn at least how to use these weapons and equipment and then to look after them, to ensure that they do not fail him in times of need. In other words, the technological environment demands a substantial degree of technical orientation of the individual soldier much more than what has been achieved in our Army today. It also demands a greater degree of understanding, comprehension and agility of mind on the part of the leaders in the operational field—from the non-commissioned officer upwards.

In the field of development, acquisition and so on of the weapons and weapon-systems, a clear need for specialisation of a nature different from what has been achieved today, seems to be called for. The 'womb to tomb' concept of weapon-system management, in the context of the technological environment, seems to demand the 'single manager' concept, which would be more effective than the present-day concept of a multitude of agencies dealing with one particular weapon, weapon-system or of a generic group of equipment.

In short, the effect of the technological environment has been to radically alter the interpretation of the term 'task-specialisation'—both at operational and higher levels. This change in interpretation calls for different types of groupings of men and material at all levels to ensure a high degree of effectiveness of the Army organisational structure. The technological environment calls for a reappraisal of its very basis—the concept of arms and services. Once this concept is affected, it is obvious that the whole edifice is affected. Hence restructuring, of necessity, has to be total. Half-way measures and make-shift compromises will only reduce effectiveness.

A NEW CONCEPTUAL FRAME-WORK

As has been brought out so far, the primary need is first to assess how men and material should be grouped to achieve greater effectiveness. To do this in a rational manner, it would be more advantageous to consider the needs of the Army and then to evaluate how best the needs can be met. This is a far better and less controversial way to tackle the problem than to vivisection the existing concept of arms and services.

COMBAT ELEMENTS

There is no gain saying the fact that the primary need in the field continues to be, and will remain to be, for groups of individuals to deny or capture territory by physical occupation. This is the job of the infantry and hence the basic arm of the Army will still be infantry. The basic

grouping of the infantry is the battalion—and by experience, it would appear that the present strength of an infantry battalion is the optimum for the tasks envisaged as also for effective command of a somewhat personal character. There should be no need to alter this basic organisational block—though, the internal character of this battalion may have to undergo some change to keep in tune with the demands of the environment.

Physical capture of ground is also achieved by the use of armour-individuals who have greater 'reach' to hit the enemy and greater 'protection' from enemy's weapons than those enjoyed by the infantry. Since armour can be employed either by itself or in conjunction with infantry and since its characteristics are unique to itself, the retention of armoured units as distinct entities seems more logical than their apportionment, amongst infantry units.

COMBAT SUPPORT ELEMENTS

Apart from these two 'direct combat' elements, today's arsenal also provides for certain 'support tasks' which make the direct combat elements more effective. These combat support tasks can be identified as artillery and engineer cover. The former assists the combat elements to either keep the enemy at bay or to lessen his effectiveness in holding ground. The latter make the movement of own combat elements effective or renders that of the enemy difficult. Since the magnitude of these tasks, their nature and degree of expertise are such as to enable viable grouping of specialised men and material, it is evident that these combat support elements could also claim for a distinct entity for themselves and this claim can be conceded. However, their character will have to alter. Artillery will mean only Combat Support Artillery, less the Air Defence element—the latter being merged with missiles and aircraft organisations to form a new Service, perhaps. The engineers will have less works responsibility.

COMMUNICATIONS

The Combat and Combat support elements need co-ordination and direction. They have also to be mixed optimum proportions to accomplish certain tasks aimed at achieving the overall goals in a theatre of operations. In other words, after identifying and interpreting 'task specialisation' and its needs, we should turn our attention to 'unity of direction.' But before grouping for effective direction, it would be appropriate to recognise the important need for communication facilities—for, without this vital support, Command and Control loses all meaning. While it is easy to discern that all communication facilities within a combat or combat-support unit has to be not only manned but also operated by the unit personnel themselves, it is rather difficult to identify whose task it

should be to operate communication networks—both lateral and vertical in the field as well as across the length and breadth of the country.

Today and in the near future, the trend is towards 'Area Communication'. ie the establishment of static (and some semi-mobile) communication centres to which any unit or formation can 'hook on' and be able to communicate laterally and vertically. It would therefore appear that a distinction between static and mobile communication facilities has to be made. It is also apparent that with such a division, the static communication facilities could be utilised by more than one service and hence would perhaps form an entity outside the Army—whereas mobile communications in the Combat Zones would continue to form a vital part of the Army structure. Considering that 'Area Communications' would drastically cut down the functions of the present-day field signal regiments as we know them, one might conclude that Communications in the field should be left to the users. However, more than inter-unit communications it is the inter-formation communication that is of vital concern in finally deciding this issue.

It is felt that formation headquarters would continue to need a viable group of operators and maintainers of communication equipment as well as a range of equipment which would need expert knowledge to keep operationally fit. Also, such expert knowledge, if available at the Divisional level, would aid in ensuring a short replacement chain for equipment with user units which could result in greater efficiency. Hence it is advocated that 'Combat Communications' units at appropriate formation levels should be maintained as distinct entities. However, due to the comparatively smaller size of this element, there does not appear to be a need to maintain it as a separate arm.

LOGISTICS

From the foregoing, it would appear that the present-day 'arms' will continue to exist as such despite the technological revolution. However, their scope and character would alter from what is existing today. In the field of logistics, however, the technological revolution would impose more drastic changes in the organisational structure itself. In this context logistics can be considered as having two distinct aspects :—

- (a) Relating to the personal requirements of the soldier ; and
- (b) Relating to the weapons, weapon-systems and such other warlike equipment.

Personal Requirements. These relate to the wherewithals for an individual to live and sustain himself. It encompasses such items as rations, clothing, tentage, personal equipment and so on. Obviously, at unit level, the present-day quarter-master should continue to deal with this. At the next higher logistic level ie Division, it would be better for one

organisational set-up to deal with all these items than to have separate 'services'. As the level of hierarchy rises, the acquisition, stocking, maintenance and issue of these items would constitute a viable task for 'commodity management' groups. Overall policy direction and co-ordination could still continue to be based on the grouping of tasks as at divisional level.

WAR LIKE EQUIPMENT

- (a) The technological revolution has provided a multitude of weapons and weapon-systems. These have to be used in an integrated manner at field levels but need individual management at higher levels because of the quantum involved as well as the need for expertise to develop, acquire, stock, maintain, issue, repair and discard them.
- (b) At the unit level, the grouping of weapons and weapon-systems would be limited and the needed expertise to operate and maintain should be with the user himself. For many of the equipment, repair, even at field level, would mean provision of specialist personnel, costly tools and equipment, controlled environmental conditions and so on. Taking into consideration the degree of sophistication, the size of population of the equipment, the cost factor and so on, it should be possible to lay down the extent of 'repair' at various levels and the level at which replacement could be effected. It is felt that the present echelons of repair could form a basis for evaluation though they may need considerable revision. Thus, for a number of communication equipment, the present 'field repairs' could be possible at divisional level only. However, the user could, because of the low cost factor of individual equipment, get a replacement when his equipment needs such repair than to await repair. In the case of AFVs, guns, radar and so on it could be more profitable to ensure a wider range of repairs at lower levels and replacement level raised to the next higher echelon above the Division. This 'repair Vs replacement' policy would require deeper costs effectiveness studies but the method suggested is expected to be effective in our context to a large extent.
- (c) At the higher levels of organisation which concern themselves with larger issues of development, acquisition and so on, it is a clear necessity that the organisational structure should provide for the single manager concept for weapons and weapon systems. This concept ensures greater attention to problems and makes the structure flexible enough to absorb new technology and weapon-systems in a more homogeneous fashion.

IMPROVED EFFECTIVENESS

Having involved a basic conceptual framework, it would now be possible to devise an outline organisational structure which would lead to improved effectiveness in a dynamic environment.

A suggested structure for the Army is given in Appendix 'A'. The salient features of the proposal can be summarised as follows :—

- (a) Considering the national security policy of the country for the present and for the foreseeable future, the Army is unlikely to indulge in large-scale mobile operations. It would be engaged predominantly in defensive operations with adequate ability for offensive actions in conjunction with defensive missions. It is therefore apparent that stress should be more on geographical location of units with regionally based unity of direction and control. This could call for predominantly static regional Commands self-contained for specific operations and for specific durations. In this context, the existing concept of Command Headquarters needs to be given up, as they would largely be on unnecessary link in the chain of Command. This is not a direct outcome of the effect of the technological environment but is more in the nature of suggesting adoption of a 'total' concept for effectiveness. The outline organisational structure for a typical Regional Command is in appendix 'B'.
- (b) In the attempt to be in tune with the technological environment and in line with the single-manager concept outlined earlier, new executive Commands in the field of training, logistics and works have been proposed. A further breakdown of the structures of these Commands are to be found in Appendices 'C' and 'D' respectively.
- (c) The staff structure is now freed of executive control and it can concentrate more on formulation of policies and plans with the executive Commanders being directly responsible to the head of the organisation. The philosophy is apparent even in the Regional Command structure and would definitely lead to improved effectiveness.
- (d) To round off the proposal, the organisational structure for an Infantry Division is given in Appendix 'E'. This clearly brings out the integration of related functions under one executive as also the concept of greater technical proficiency of the operator advocated in this paper.

MANPOWER ORGANISATION

A perusal of the proposed organisational structures straightaway reveals the absence of any of the 'services' as we know today except for Medical Corps. However, their functional viability is apparent despite such elimination. Having conceded this viability, a question may arise as to how the problems of recruitment and allocation of manpower could be tackled. If the concepts outlined are acceptable, it should not be difficult to overcome these apparent problems. These concepts envisage a soldiery more technically oriented than at present. Recruitment rules must be changed to cater to this imperative need. If this is done, all recruitment could be into one or all of the Combat or Combat support elements which constitute the Army. Thereafter, depending on aptitude, qualifications, in-service training and experience, selected personnel can be utilised in communication units, logistic units and formation headquarters-perhaps initially on tenure basis and later permanently. It is quite feasible to achieve such mobility both in the officer and Other Ranks cadres. Besides being in tune with the technological environment, this measure would, to a great extent, contribute towards cohesion amongst the army personnel and consequently towards greater effectiveness. To this end the proposal envisages even changes in the nomenclatures of certain appointments.

In implementing the proposal certain difficulties like maintenance of individuals' records, career prospects, selection criteria and so on are bound to crop up. In the case of the officer cadre, this is no problem. In fact, the type of mobility now existing between staff and Command appointments can be extended to cater to the new needs. Career prospects will be wider and the present disparities and discriminations between arms and services, between different arms and so on, will be considerably narrowed if not eliminated. In short, the proposal will achieve a high degree of 'emotional integration' amongst the army officers.

In the case of JCO's and OR, measures like having record offices based on Combat and Combat support elements may be taken. To cater for the need to handle the problems of increased numbers, (because of elimination of many of the existing 'Corps') these offices may be further designated to deal with say, 50,000 effective personnel who could be belonging to specific Combat units. When such personnel go over to logistic units on a permanent basis, the same record office can continue to administer them while their career prospects can be looked after by the logistic command. It is felt that such problems are not insurmountable if the initial resistance to change is overcome.

CONCLUSION

An organisational structure, to be effective, must be dynamic. The degree of dynamism is dependent upon the flexibility of mind achieved by the leaders who are responsible to manage the affairs of the organisation. Parochialism and conservatism are traits which are not conducive effectiveness. An organisational structure, in addition to adapting itself to the environment, must also be such as to minimise the dominance of these unwanted but human traits. It is possible, given the will, to restructure the Army to achieve improved effectiveness in a marked manner. Such restructuring can be a prelude to the restructuring of the national security structure as a whole. One point to be borne in mind in all such endeavours is that own requirements should be the predominant criterion as against the precedences set by other countries—though the latter, if studied dispassionately, may provide useful guides for application in one's own environment. The present proposals do have some similarity with the organisations in other countries as well as with our own Air Force. However in deriving them, the effort has been to minimise the effects of any such preconceived ideas. Finally, these proposals are not meant to be blue prints for immediate implementation. Instead, they may be construed as 'trigger-off' points for instituting purposeful and detailed studies aimed at improving the Army organisational structure.

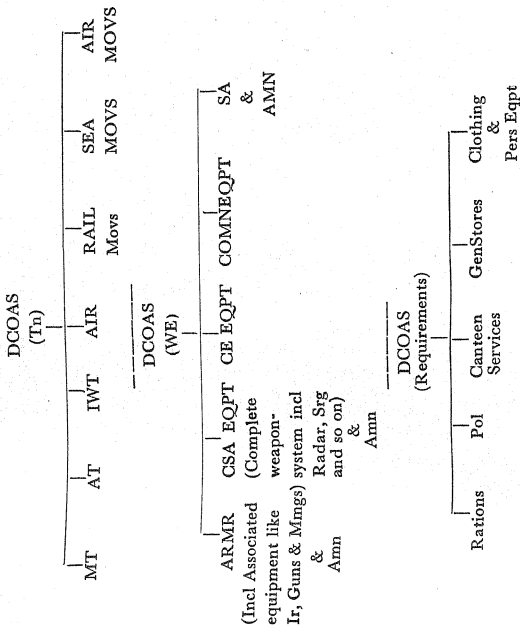
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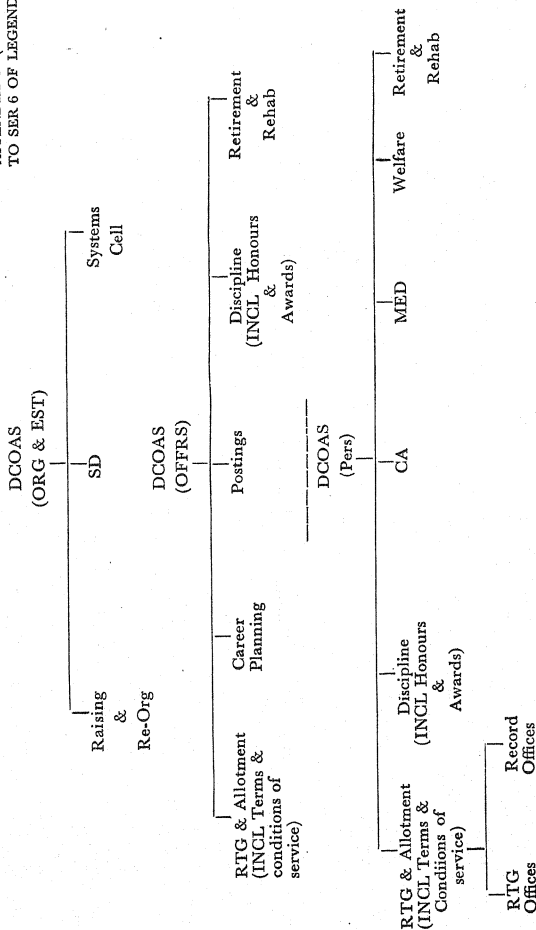
ARMY HEAD-QUARTERS
SOME TYPICAL STAFF STRUCTURES

ANNEXURE 1 TO
APPENDIX 'A' (REFERS
TO SER 5 OF
THE LEGEND)



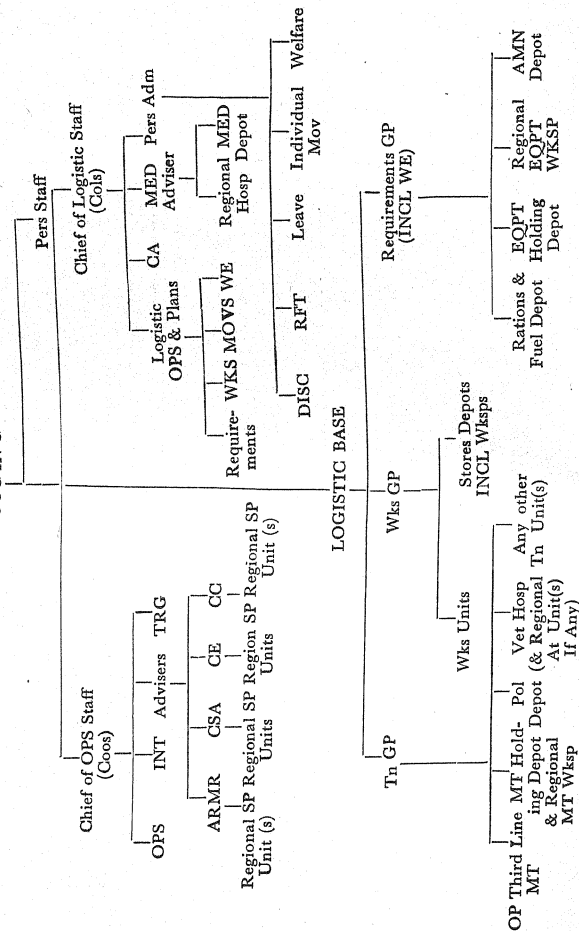
ANNEXURE 2 TO
APPENDIX 'A' (REFERS
TO SER 6 OF LEGEND)

STAFF STRUCTURE UNDER VCOAS (PERS)



APPENDIX 'B'
REFERS TO
PARA 23(a)

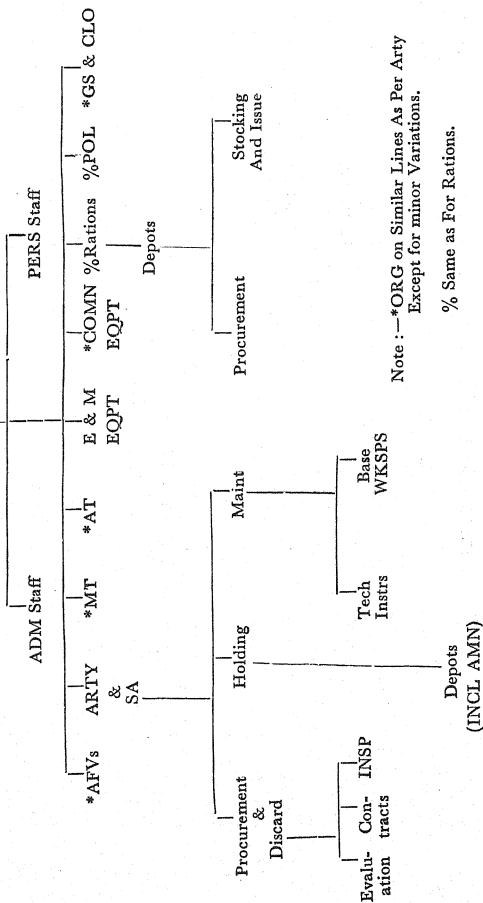
REGIONAL COMMAND STRUCTURE
(EXCLUDING OPERATIONAL FORMATIONS UNDER COMMAND)
GOC-IN-C



LOGISTIC COMMAND

APPENDIX 'C'
(REFERS TO PARA 23 (b))

GOC-IN-C

Note :—*ORG on Similar Lines As Per Arty
Except for minor Variations.

% Same as For Rations.

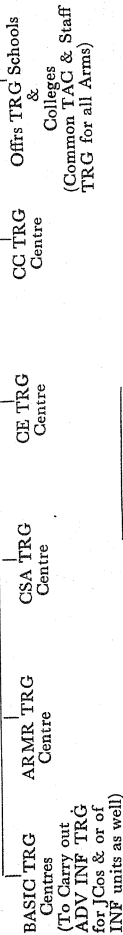
APPENDIX 'D'
(REFERS TO
PARA 23 (b))

TACTICAL TRAINING COMMAND

GOC-IN-C

ADM Staff

PERS Staff

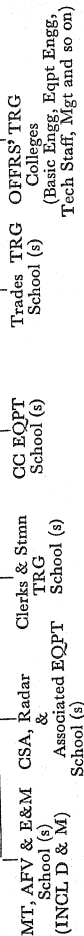


TECHNICAL TRAINING COMMAND

GOC-IN-C

ADM Staff

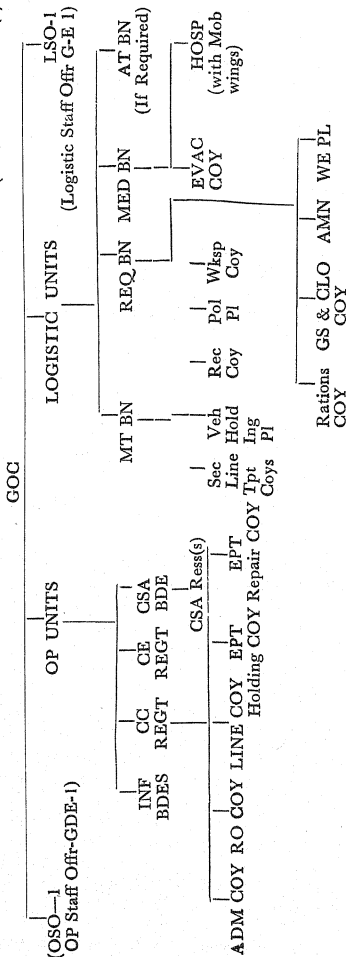
PERS Staff



INFANTRY DIVISION

APPENDIX 'E'

(REFERS TO PARA 23(d))



NOTES

1. Mt held by units will be repaired to the extent possible by the units themselves. When beyond unit capabilities, they will be replaced by MT BN, repaired in DIV MT WKSP and held in the VEH holding PL.
2. The MT BN WKSP will hold MT Spares, Tyres, Tubes and Batteries as well.
3. Other EQPT CE EQPT, Guns and so on will be repaired by units upto present FD repair Standards. Replacement Chain for such EQPT will be between unit and regional Logistic Base.
4. The structure in out-line for the CC COY is a typical one to indicate the philosophy behind the ORG structure. It is applicable with minor modifications to other SP Regts as well.
5. EQPT held by INF BDE CC COYS will be replaced by CC REGT when they need repairs. Otherwise BDE CC COYS are integral to BDES and not to CC REGT.

LOW LEVEL AIR DEFENCE

BRIGADIER J R MALHOTRA

"Give us the tools and we will finish the job"

—WINSTON CHURCHILL.

THE advent of the jet engine in the concluding stages of World War II revolutionised aircraft performance, particularly at high altitude.

It became apparent that jet aircraft had outstripped the capabilities of anti-aircraft weapon systems. Attempts were made to increase the effectiveness of the heavy anti-aircraft guns in terms of range, rate of fire and accurate prediction. But even while these attempts were being made, it was apparent that the future of air defence depended on the development of guided missiles as the only practical means of conveying an explosive warhead to an aircraft target. Consequently 1950's and 1960's saw the development and introduction of medium and high altitude air defence missile systems.

Low-level defences were not blessed with a missile system because of the "state of art" at that time. Pulse radars were not efficient at low level and miniaturisation techniques were still at an early stage of development. Consequently low-level air defence continued to rely on the gun. However, the gun was not an efficient system. To overcome the problems of prediction and continuous fire at very high rates, electronic fire control instruments (FCI) were developed and introduced into service. The FCI-gun combination became the standard weapon of low-level air defence in the 1950's and it remains so even today in many armies. It is, however, being replaced by low-level surface-to-air guided missile systems. This process is as inevitable as that which saw off the heavy anti-aircraft gun systems.

COST EFFECTIVENESS

The advances in aircraft design, avionics, weapons and low-level attack techniques have rendered present-day gun defences ineffective. Furthermore the "state of art", particularly in miniaturisation of components, coherent pulse doppler radars and automatic missile guidance techniques, has made possible construction of viable low-level surface-to-air guided missile systems. Additionally military and government authorities are becoming increasingly conscious of the "cost effectiveness" of a weapon system.

Cost effectiveness is a complex and many-sided problem. In simple terms, to assess the cost effectiveness of a weapon system is to determine

the degree to which it provides a worthwhile solution in relation to manpower, time, money and national resources devoted to it. While the matter of "cost" is easily understood, "effectiveness" must be related to the task which the weapon system is required to perform. In the context of the low-level air defence weapon systems, this aspect leads directly to the consideration of the air threat at low level and the efficiency with which it can be combatted.

The all-weather threat is posed by the operation of specialised ground attack aircraft at night or in conditions of poor visibility. Spectacular advances in avionics and air borne radars, including terrain following and terrain avoidance radars, have made such attacks possible. However, such aircraft are as yet very expensive and require highly trained crews. Targets are perforce restricted to those that can be pinpointed by radar. In bad weather, and near-zero visibility conditions, formation flying is difficult and aircraft are unlikely to operate below 30 metres above ground level (AGL). Therefore, while the all-weather low-level air threat exists, at present it is comparatively less than the daylight threat. However, as time passes it will increase both in numbers and intensity.

The daylight low-level threat is real even now and is posed by a variety of helicopters, propeller-driven aircraft and jets, both for reconnaissance and ground attack, using a large range of air-to-ground weapons. Wave attacks by 12 or more aircraft, flying in groups of 4 can be used. Separation in time and space between aircraft within a group, as also the time interval between groups of aircraft in a wave, would be dictated by the type of target, the air-to-ground weapon being employed, low-level air defence capability of the target and, of course, the standard of the air crews. The attacker, however, would try to reduce these time intervals to the minimum possible with the aim of saturating the defences. The attack altitudes could be as low as 7 metres AGL. The attacking aircraft would make the maximum use of terrain so as to avoid detection until the last possible moment, and weapon loads would be organised so that each aircraft need only make one pass at the target, thus increasing its chances of survival.

Speeds of attack would vary widely, depending on the type of aircraft employed. Lowest in the speed scale are the assault helicopters, which constitute a significant and increasingly dangerous threat. These may have to be picked off at the hover. As far as jet aircraft are concerned it would be reasonable to expect very low-level attacks at a speed of about Mach 0.9 (300 metres per second). Low-level attacks at supersonic speeds are possible. However attacks at such speeds are not only dangerous and fatiguing, but can only be mounted against well-defined targets, as target identification becomes difficult, if not impossible.

Attacks at supersonic speeds may thus have to be made at heights above 100 metres AGL.

The daylight low-level threat can therefore be implemented with a large force of aircraft. However, the all-weather threat also exists albeit by a smaller number of aircraft at present. As the time passes this threat is bound to increase. Low-level air defence must, therefore, be capable of not only defeating the small number of all-weather attackers, but also have an engagement capability to cope with much larger number of daylight attackers.

BASIC CRITERIA

An efficient low-level air defence weapon system must meet certain basic criteria. The functions such systems are required to perform and the components required to perform these by gun or missile systems along with a rough comparison of equipment and manpower are given in the tables shown below :—

Table 1—Functions and Components

<i>Funtion</i>	<i>Task</i>	<i>Components</i>	
		<i>Gun system</i>	<i>Missile system</i>
Detection of target	Continuous all round coverage. Observation and report.	Local Warning radar. Observation posts.	Integral surveillance radars.
Evaluation of targets	Identification Type, Course height and speed.	IFF system Command post staff	Automatic IFF and computer.
Target designation	Warning. Transmission of target data.	Target designation unit. Radio Operators.	Computer.
Target Acquisition and engagement	Search. Identify. Track. Engage before weapon release.	FCI. Two to three guns.	Integral fire control radar, computer and launcher.
Report	Pass results of engagement.	Radio Operators. Command Post Staff.	Autom atic indications.

**Table 2—Rough Comparison of Equipment/Manpower
(Typical 4 Firing Unit Battery)**

<i>Fighting echelon</i>	<i>Personnel Required</i>	
	<i>Gun System</i>	<i>Missile System</i>
Firing Units (4)	72	12
Surveillance radar and generator	(1) 6	—
OP Parties	(6) 18	—
Command Post	(1) 6	(1) 3
Heavy vehicles	(24) 24	(8) 8
Light vehicles	(13) 13	(5) 5
<i>Administrative Echelon</i>		
Heavy vehicles	(10) 10	(5) 5
Light vehicles	(2) 2	(2) 2
Personnel (approximately)	40	20
Total personnel	191	55

Note :—(a) One gun firing Unit consists of an FCI, two guns and their generators.

(b) Figures in parenthesis show number of equipment/vehicles/parties.

Detection of targets is a primary condition because without it no engagement can begin. Radar is the only practical way of achieving it. Rings of observation posts with their reliance on human sight and reaction are comparatively inefficient and are thus not a workable solution in the present environment. Observation posts are, however, a useful adjunct to the surveillance radar. These can be deployed to cover the radar dead zones. Many systems rely on separate surveillance radars for early warning entailing the passage of target information over some kind of communication network and the resolution of the displacement problem for each firing unit. Such system suffers from many drawbacks, the important ones being :—

- (a) Surveillance radar not ideally located to give equally effective coverage to all FCIs served by it ;
- (b) Compromises in deploying surveillance radar leading to blind zones, otherwise usefully covered by FCIs ;
- (c) Separation distances between surveillance radar and FCIs restricted by cable links, effecting deployment pattern. Cables are vulnerable unless well dug in. Radio data links, if used instead, are expensive and complex ;

- (d) Increased deployment time due to cable laying, necessity for accurate lining-up and calculation of displacements between surveillance radar and FCIs ;
- (e) Increased reaction time for passing target data to FCIs ;
- (f) Failure of one surveillance radar seriously degrading engagement capabilities of all the dependent FCIs.

From the above analyses, it emerges that the only satisfactory solution is for each firing unit to have its own surveillance radar, having a high data rate and using pulse doppler techniques. Gun systems relying on separate surveillance radars, backed by rings of observation posts, thus do not meet this criterion of a modern low-level air defence system. In some modern gun systems, however, this is being remedied by mounting surveillance radars integral to the guns. All the low-level surface-to-air guided missile systems, on the other hand, have specially designed surveillance radars integrated with their firing units.

TARGET EVALUATION

Evaluation of the detected target, an important criterion, involves its identification to determine whether it is a friend or foe, determining whether or not it is within system coverage, and deciding whether or not to engage it. If the decision is to engage then the firing unit best suited to engage a particular target has to be alerted and target designated to it. This target designation involves passing target data, such as direction, range, type and altitude. These functions are difficult to perform in systems having separate surveillance radars, as it invariably involves a separate IFF unit and a filtering and telling process. Modern missile systems are equipped with automatic IFF and use computers for target evaluation and designation thus leading to a saving in time and manpower.

After the target has been detected, evaluated and designated the firing unit has to acquire it and track it satisfactorily before launching a missile or firing shells against it. The time interval between target detection and fire being opened is termed as "Reaction Time". A short reaction time is absolutely essential in any low-level air defence systems. This is governed by the short detection ranges of radars at low level, high target speeds and comparatively small maximum impact ranges of low-level weapons. Reaction time thus has a direct bearing on the weapon system coverage ; shorter the reaction time the better the chances of engaging a target at the maximum range of the weapon ; and better the chances of multiple or repeat engagements.

Although the performance details of low-level surface-to-air missile systems are highly classified it is no secret that the maximum effective

ranges of the modern missiles lie between 6 and 10 kilometres, as against the gun-effective ranges of 2 to 3 kilometres. Effect of weapon system range on defence effectiveness, in terms of number of firing units of guns or missile required and coverage provided for adequate defence of a key area, can be easily assessed by a simple graphic presentation. Such a study reveals that for providing adequate defence of a key area the ratio between missile and gun firing units varies between 1 to 4 or 5.

The next, and the most vital criterion is the actual engagement itself, the aim being to engage and destroy the attacking aircraft before line of weapon release. This could be termed as the operational effectiveness of the weapon system, and is generally expressed as its "overall kill probability." The three factors which enable an assessment of the overall kill probability are reliability, hit probability and lethality of the warhead.

Reliability can be expressed as the probability in percentage of all the components of the system functioning correctly throughout the engagement. Engagement reliability of the low level missile and modern air defence gun systems is of an equivalent standard and need not therefore be considered any further.

Probability of hit of a weapon system depends on system errors, namely, bias, prediction and ballistic dispersion errors. Bias, errors are introduced by operator tracking, servo hunting and lag, data transmission and equipment alignment. These are most applicable to guns than missile systems. In the case of missiles system, these get nullified as the missile are continuously guided after launch.

Prediction errors are possibly the most important group of errors applicable to the gun systems. Once a shell leaves the barrel of a gun, its trajectory cannot be altered. Therefore any errors in the prediction process assumes constant speed and course of a target from the moment the gun is fired until the shell hits the target. Any changes in the predicted target position, resulting from target manoeuvre during the time of flight of a shell, cannot be catered for as the shells are unguided. This drawback further reduces their hit probability, and performance against manoeuvring targets is significantly poor. Missiles, on the other hand, do not suffer from this drawback as these are continuously guided and no prediction is required. The hit probability of missiles is therefore comparatively very high and their performance against manoeuvring targets is only slightly less than that against straight and level targets.

DISPERSION ERRORS

Ballistic dispersion errors, which are only applicable to guns, result from the following :—

- (a) Atmospheric variations, ie, variations in ambient temperature, barometric pressure, and wind speed and direction.
- (b) Vibrations due to instability of the mounting or imbalance in the recoil system.
- (c) Variations in muzzle velocity due to barrel wear, difference in shell and charge weight, and changes in temperature of barrel and charge.

However accurate the aim, ballistic dispersion errors cause the shells to form a spreading pattern, its size increasing with the range. The centre of this ballistic pattern (mean point of burst-MPB) should be maintained on the target for achieving maximum hit probability. However, bias errors tend to displace the MPB away from the point of aim, and this effect also increases with range. As missiles employ continuous guidance from the time of launch till the point of impact, there are no ballistic dispersion errors.

We have thus seen that all gun systems have a prediction problem and the errors caused by prediction reduce the hit probability. While prediction errors increase with target manoeuvres, the ballistic dispersion and bias errors increase as the target range increases. The gun systems therefore have only a very small chance of obtaining a hit. Various means employed to improve the efficiency of low-level air defence gun systems and their effect on the system are given below :—

- (a) Use of twin/triple/quadruple mountings with rapid action to achieve increased rate of fire and a larger volume of fire at the target end. This has resulted in more complex heavier and costly equipment, adversely effecting mobility and increasing supply problems.
- (b) Increase in muzzle velocity to reduce time of flight. This is achieved by using higher charges leading to heavier barrels and ammunition and consequently increase in cost.
- (c) Introduction of more advanced radars and FCIs to improve prediction. This has resulted in increased weight, complexity and cost, and thus reducing mobility and increasing maintenance and repair problems.

Lethality of the warhead is the next factor which affects overall kill probability. The light air defence gun shell is small in size. Within the restriction imposed by its size, it is required not only to penetrate an aircraft structure at different angles of impact but also to contain a quantity of explosive sufficient to cause vital damage by exploding after penetration is achieved. The average weight of the 35/40 mm family

of shells is 500 to 550 grammes each. To achieve penetration the shell must be armour-piercing type in which case its explosive content may be reduced to approximately 20 grammes. In the high-explosive shells on the other hand the explosive content may be as high as 130 grammes. However, this leads to a very thin walled shell and even with delay fuse it would break up before penetrating. Thus hits by 35/40 mm shells give a very small probability of target destruction.

The payload of the missile, ie its warhead, is far bigger. Missile warhead using modern design techniques, can cause lethal damage to an aircraft by either blast and/or splinters. Some of the techniques in vogue are shaped warhead, control to spread of splinter pattern and hollow charge principle. Employment of infra-red or electromagnetic proximity fuses increases their lethality. Even the kinetic energy of a missile can cause lethal damage to an aircraft directly hit. The missiles, thus have a very high kill probability.

The discussion in the preceding paragraphs clearly establishes the superiority in effectiveness of the missiles over guns. However, the introduction of highly sophisticated low-level surface-to-air missiles poses certain problems, especially applicable to developing countries. These problems, as given below, are not unsurmountable and can be easily overcome by pre-planning, selective investment and spending and suitable reorganisation of the armed forces :—

- (a) Creating industrial infra—structure for manufacture of the weapon system and its components/spares.
- (b) Logistic backing for provisioning of a large variety of electronic, electric, hydraulic and mechanical components and spares.
- (c) Maintenance and repair philosophy and organisation to cater for the modular concept used in these equipments.
- (d) Establishing sophisticated and extensive test facility.
- (e) Provision of suitably instrumented ranges and high-speed targets.
- (f) Higher educational standard of the operating and maintenance crews.
- (g) Compatibility with and absorption with the overall air defence environment of the country.

CONCLUSION

From the foregoing discussion it emerges that air defence gun systems have in general the following limitations :—

- (a) Short range with small probability of hit and low lethality.
- (b) No performance against manoeuvring targets and low performance against crossing and receding targets.
- (c) large number of heavy and complex equipment required for defending a key area.
- (d) Larger manpower requirements and increased logistics support.
- (e) Longer deployment time due to cable connections and lining-up procedures.
- (f) Increase in weight and consequently reduction in mobility, air portability and helicopter lift capability.

Low-level surface-to-air missile systems, on the other hand, have the following advantages :—

- (a) Long range with ability effectively to engage manoeuvring, crossing and receding targets.
- (b) High single-shot kill probability.
- (c) Small number of firing units required for defending a key area.
- (d) Light-weight equipment, which is highly mobile, and air portable.
- (e) Small manpower requirements and simpler logistics.

Low-level air defence gun has reached the peak of its development and has nothing more to offer in the way of performance. Even when controlled by the most advanced fire control instruments, its inherent disadvantages remain.

Various low-level surface-to-air missile systems have been developed and are either already in service or coming into service in many countries. These systems employ modern and sophisticated techniques and have very high performance figures.

There can really be no contest between guns and missiles. The cry "guns versus missiles" is outmoded. There is a choice of weapons, but this lies only between the different types of low-level surface-to-air missile systems.

A NEW ORGANISATION FOR SUPPLY COVER

LIEUT COLONEL Y A MANDE

INTRODUCTION

IN the School, we have ample opportunities to listen to the views of various visiting speakers. During one of the talks, a question was raised by a very respected, now retired, supply expert, "Sir, the supply cover in your command was organised to meet the urgent needs of emergency caused by the Chinese aggression in 1962. There has been little change since then. Do you think there is a necessity to re-organise supply cover?"

Ever since, I have been tossing this question in my mind. All organisations are created to serve a specific goal under a certain set of conditions is constraints and parameters. One would, therefore, naturally expect change with changed conditions. If we analyse this question further, it will be seen that our present organisation of supplies is more or less the same as inherited from the Second World War. This would mean that either our supply system evolved during the Second World War was a piece of perfection or we have reached a state of stagnation.

In this article, I am presenting anew organisation for supply cover to armed forces. The suggested "Supply Group" organisation will overcome many of the difficulties faced at present and is primarily designed to suit our conditions.

CHANGED CONDITIONS

THE present supply organisation was developed during the alien rule in war time. Security and certainly are very important factors under such conditions. After independence, the problems of security and certainty have scaled down to a great extent. For a national army there is no room for unnecessary alarm. One can rely on full cooperation from civil administration.

The supply organisation of the Second World War was designed to meet the requirement of forces operating far and wide—some in the remote and undeveloped areas of Burma and others in overseas theatres. The organisational problem was to design units which could be sent anywhere to perform their role. This situation no longer exists. The role of our army is confined to the frontiers of India. One can forecast

requirements with reasonably accuracy. Under such conditions, static supply cover should be organised for geographical areas rather than units based on Second World War pattern of universal applicability. Also, the organisation should be tailor-made to foreseen requirements.

Attempts to reorganise the existing supply system must take into account the two important civil marketing organisations viz F.C.I. and I.O.C. Their inter-relation with our supply organisation has to be considered. The Administrative Reforms Commission has already emphasised the importance of integration of public utility services. The inter-relation has to be considered in the light of procurement, holdings and issues. It will be noted that the source of procurement is the same and holdings in the rear areas can be easily merged. The major difference lies in the function of distribution and issues.

Irrespective of the degree of integration the armed forces will always need an organisation for selective holdings and distribution. Other factors which necessitate the separate supply organisation are range of items held, uncertain and at times adverse supply situation and holding of operational reserves.

Supplies are available in the developed agricultural areas. And therefore, we may even say that they are available in large cities and townships because of ease of transportation, storage and handling facilities, and large and regular civil requirements. But the army is deployed in remote, inaccessible areas. Thus the problem of supplies in the normal course, is that of distribution and not procurement or holding. In practice, this problem is particularly accentuated in respect of fresh supplies where we want contractors to deliver supplies in forward and remote areas.

Somehow the question of transportation is always linked up with the supply of materials. I am not exercising my mind in dichotomy but let us be pragmatic and differentiate between—

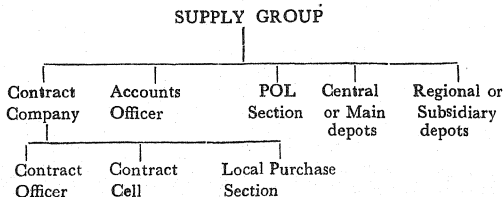
- (a) Transportation and delivery of goods in developed areas ;
and
- (b) Transportation and delivery of goods in remote and undeveloped areas.

From the above, it would follow that the responsibility of supply organisation should end at places where good transportation, storage and handling facilities are available. Collection and distribution should remain the responsibility of field formations and units. Distance should not be the criterion as it only means additional cost of transportation which either goes to the contractor or is borne by the State.

Procurement and holding of supplies in our context ought to be a geographical responsibility. It should be part of static military coverage of areas and communication zones. If we hold 10 days stock for 80,000 troops, it is immaterial where troops shift. The stocks are still in the area and the problem remains only of transportation and distribution. In the last December 1971 war, it was noticed that static administrative cover did not keep pace with field formations, thus affecting their flexibility and optimum employment. As a matter of principle, static administrative cover should be positioned and ready before the move of field formations. Such lapses occur because of organisational flaw.

SUGGESTED ORGANISATION

Let us now consider the suggested organisation for supply cover to the armed forces. The various difficulties felt in the present functioning will emerge automatically during subsequent discussion.



What are the distinctive features of the suggested organisation and how are they advantageous in relation to the existing organisation. ?

ALLOCATION OF SUPPLY GROUPS

Supply groups should be formed for each theatre or geographical area. As it exists on the ground, a number of big and small depots, in relation to a geographical area, can be grouped under one supply group. This should not present any difficulty.

ORGANISATIONAL DESIGN

The Headquarters of the Supply Group will exercise command and control on all depots within the area. It will be responsible for control and holding of stocks. It will conclude contracts and operate them. The local purchase section will carry out purchases for the entire area.

Such a function of the Supply Group is a radical departure from the existing system. It is based on the principal of Unity of Command, as

also Chain of Command. Under such organisation, authority and responsibility are fully matched. Staff and line function are coordinated at the lowest level. Decision-making has been simplified and it is at a level where it can be implemented without undue delay. These are some of the important principles of organisation which have been kept in view while evolving the new organisation. Their impact on functional efficiency will be clarified later.

CONTRACTS

Under the existing system, the functions of contract conclusion and operation are separated. Those who are authorised for conclusion of contracts do not take the responsibility for its operation, thus negate the principle of inter-relation of Authority and Responsibility. I have talked to a number of officers commanding supply depots. Generally, their complaint was the same i.e.—that people who conclude contracts are least bothered about the difficulties of those who have to operate them. I met one officer commanding of ASC Battalion who was responsible both for conclusion and operation of contracts. This officer commanding had no difficulties about the supplies. He used to say "I give best to the troops but then I also pay the contractors well." All that the author wishes to say is that this officer commanding could do it.

Separation of responsibility where money is involved, follows the age-old British pattern of checks and cross-checks. Even our pamphlet on Regimental Accounts says that funds within a unit should be operated by as many officers as possible. In other words, "Let the blame be shared by as many as possible."

Luckily modern management has come out of such shackles. Control against fraud and misappropriations are necessary but there are other effective ways of doing it. Under no circumstances should fears of irregularity and resultant measures affect functional efficiency. In other words, control the horse but don't pull the reins so much that the horse is allowed only to walk.

In the existing system, time-consuming correspondence take place between contract concluding and operating officers. Decisions are delayed as no central authority is laid down. In the suggested organisation, it will be noticed that officer commanding Supply Group controls both concluding and operating officers. Also the decision-making authority has been brought as close as possible to the execution level.

CONTRACT CELL

Lately there has been considerable talk about Contract Cells. What exactly should be the composition of the cell and its function?

A cell, as the name signifies, is a data collection and storage centre. It performs staff function for the line work. In matters pertaining to contracts, information is required regarding local resources, suppliers, specifications, market rates and so on. It appears funny that to arrive at reasonable market rate, one has to furnish information regarding rates for the last three years. To modern management with simple aids such as prediction and trend analysis, there is no necessity to run for information every time. All these can be shown by graphs.

The establishment of cells will help in speedy conclusion of contracts. It will cut out duplication of work at various levels relating to local resources, contractors' diary, market rates and so on.

All major organisations must be forward-looking. This is only possible by the establishment of efficient cells. The study of meat contracts by this time should have clearly shown that it is high time that the army goes in for big and modern farms for table birds. Meat, besides availability, is going to be more expensive than chicken.

LOCAL PURCHASE

A supply group controlling a number of depots and covering a large geographical area will need a local purchase section.

In a supply organisation, local purchases meet the important requirement of contingency planning and flexibility. The ideal is, and one should strive to achieve it, a situation where flow of requirements is smooth and all contracts function smoothly. But such a state is seldom possible. The uncertain conditions of today will continue and will be a challenge for the management.

The difficulties in regard to local purchase are well known to supply officers. It is necessary to revise local purchase rules to provide flexibility. Let us take an example. A unit wishes to go out for training with pre-cooked rations. The unit is willing to forego fresh vegetables but request they should be given pickles in lieu. The requirement is very legitimate but there is no way of doing it under existing regulations. A common trouble with local purchase is that powers are vested in supply depots in the rear areas whereas local purchase is required by troops in the forward areas or officers commanding ASC battalions. Also, the facilities and the items required for local purchase are not available at the place required.

These difficulties bring out the necessity for revision of local purchase rules and creation of a separate local purchase organisation. The individual depots should be relieved of such responsibilities as much as possible. Supply organisations must have in built capacity for flexibility as it deals with items required for daily living.

ACCOUNTS OFFICER

The supply group organisation should have an accounts officer of CDA with wide decision-making powers.

In the existing organisation the difficulties relating to CDA are well known. The experience of majority of the administrative departments with CDA is frustrating. They contend that financial controls are too rigid. You can't even move a pin before financial sanction.

It is worthwhile examining the relationship of CDA as it concerns many other departments besides supplies, with whom it is very intimately connected. CDA is confused with financial advisors or department which ensures economy in public expenditure. Any talk of economy without taking into account functional efficiency and growth is absurd. CDA performs only a part (and that too not a major part) of financial function ie audit. The audit is likened to a watchdog function, with the exception that this dog barks invariably after the thief has left.

Once the budget has been finalised and allotted, the function of CDA is internal and therefore it should be organic to the department. CDA should ensure that expenditures are incurred as per the policies of administrative authorities. Economy is the responsibility of administrative departments and to be an efficient watch dog, CDA must function under and within the department and not outside. It is heartening to note that the government has accepted such a role for CDA under the new system of budgetary controls.

The external functioning of CDA, as at present, is organisational flaw which accounts for delay and frustration. Too much time is wasted in papers going up and down. Under such system, coordination of mind and decision-making become difficult.

With the representative of CDA within the supply group all money matters, including contracts, will be finalised within the supply group. Cases pertaining to money matters need only go out for the approval of administrative CFAs.

It is interesting to note that some of the big army organisations have worked very satisfactorily during emergencies where a responsible representative of the CDA was posted to the organisation.

As a matter of principle, decision-making by administrative authorities must not be delayed because of audit advice and procedures. The inter-relation of contracts, local purchase and accounts officer will provide immense flexibility to the supply group organisation.

POL SECTION

The POL section of the supply group will be responsible for the supply of POL to the entire area. Perforce it will have detachments with supply depots within the area.

Supply of POL should be further integrated with Indian Oil Corporation. We should concentrate on holding of reserves and products not normally used in civil life. Common utility products, except where facilities do not exist, should be provided to units by IOC under contract. This scheme already exists but enough scope remains for its enlargement.

There is no necessity for separate establishment for Petroleum Contract Units. It is a liaison function. Such responsibilities should be given to commands and where necessary personnel should be attached to local depots for administration.

A separate POL section within the supply group will lead to economy and functional efficiency due to specialisation and division of labour. It will considerably cut down the work of supply depots.

SUPPLY DEPOTS

A supply group will consist of a number of depots, some big, others small, and tailor-made to actual requirements such as bakery, butchery, local purchase, POL and so on. Stocks will be held according to operational commitments, communications, handling and storage facilities.

One may argue that such arrangements already exist. Sure enough, the arrangements do exist but command and control arrangements are faulty. Let us take the aspect of demands and control of stock. In the present system demands are sent by all depots. Stock control boards are maintained at every level. One would expect higher headquarters at command and army level to devote time on planning but instead they seem to indulge in management by details rather than exception.

Under the new organisation, the numerous day-to-day problems will be sorted out at Supply Group level. Higher headquarters will deal only with few supply groups.

Flexibility and economy are other great advantages of the organisation. Consider the following:—

- (a) Raising of new depots in emergency and adjustment of workload.
- (b) Simplification of postings, adjustment of personnel according to command or individual requirements.
- (c) Simplification of reinforcements during war.

FUNCTIONAL EFFICIENCY VERSUS BIG ORGANISATION

It will be noticed that the supply group is going to be a big organisation. One may therefore ask: will such organisation be practicable from the functional point of view? Such a question is valid despite the modern trend of a small organisation becoming big, and big organisations bigger.

My answer is positive—Yes. One should notice the following features:—

- (a) The responsibility of officer commanding supply group will indeed be heavy and diverse. He will have to be a very senior officer. He should be able to command effectively provided he exercises management by objectives and exceptions. One should note that a good boss can get good results from faulty organisation whereas a bad boss can ruin even the best organisation. This is something apart; an organisational man strives to evolve a structure suitable for prevailing level of competence in the management.
- (b) If the responsibilities of the headquarters have been increased, the workload at unit level has been reduced and simplified due to specialisation and division of labour.

Such distribution of work, catered in the organisation safeguards against the malady of giving all sorts of work to units. Executive units do only one task at a time. It is the job of headquarters to sift and allot work in a manner where multiple execution by units is avoided.

ECONOMY OF SUPPLY GROUP ORGANISATION

A supply group with its large responsibilities will require a very senior officer to head the organisation. Once I was asked about the rank of the officer. I said a Brigadier. This sparked controversy regarding economy, top-heaviness and empire building. It is worthwhile considering each aspect.

The view that senior officers increase expenditure is very unfortunate. Facts speak otherwise. In administrative reforms, the commission has already brought out the necessity to reduce class III and IV employees who are responsible for increase in expenditure compared to little gain. Let us take an example. The WE of AATO headed by a Brigadier comprises 4 officers, and 20 OR. The WE also provides for 3 NCsE for a total of 24 personnel; and this is where imagination staggers.

Critical examination will reveal that supply group organisation will be cheaper. The existing establishments of DADS&T, CsASC of areas, and PCUs will be eliminated.

Top heaviness occurs with senior appointments who are not directly responsible for line function. As a matter of fact, the present organisation is top heavy with the establishments of DADS&T and CsASC of areas.

Empire building is a serious charge. The growth in ranks invites criticism from the general public, and yet, it is a phenomenon which exists in all departments. What is empire building? Sublimation of ranks or increase in size? Without going into various aspects of the tricky problem, I would only say that popular opinion should rather contend itself with overall economy.

SUPPLY GROUP AND HIGHER HEADQUARTERS

The existing commands will have two to three supply groups. The commands should be made functional. They should be made responsible for quality control, liaison and regulation of despatches of POL and supplies from the sources. They should be responsible for altering specifications as fresh supplies are regional.

At Corps Headquarters, there is no necessity for integral supply personnel. The supply group should send its own officers and staff for liaison and advice.

At Army Headquarters level, no reduction is envisaged. Army Headquarters will be able to deal directly with few supply groups in the country on routine matters such as demands, despatches and so on.

The formation of supply groups will involve formation of transportation groups who will take on the responsibility of transportation within their geographical areas. The two groups will work directly under BsASC of the command.

CONCLUSION

Our supply system as evolved during the Second World War needs reorganisation. The supply cover should be based on the role of our army, our conditions are inter-related with growing civil organisations.

The supply group envisages a geographical organisation with grouping of existing depots. The supply group will have comprehensive powers for contracts, local purchase and so on.

The existing organisation suffers from negation of organisational principles such as unity of command, authority and responsibility, specialisation and so on. In money matters it is designed for safety and precautions rather than functional efficiency and vitality. The supply group organisation will overcome these difficulties. Its greatest achievement would be flexibility and decision making.

The supply group organisation, besides added efficiency, will be economical to the State.

TOUGHENING OF MIND OF SOLDIERS

COLONEL KIRPAL SINGH (Retd).**

F.R.C. Psych (Lond)., M.S. (Harvard), D.P.M. Eng.).

INTRODUCTION

THE term "toughening of mind" is likely to have widely diverse meanings for different people. But in the army it should have only one meaning, which is consistent with the objectives of the service as a whole, i.e., the building up of determination and that attitude of mind by which one willingly makes sacrifices to carry on the duty assigned to him even in the face of grave danger to himself as met with in the battlefield. Napoleon, in one of his letters, wrote "In War the spiritual is to the material as three to one". This is certainly true and however good be our equipment and all other material factors, nothing can win the war except the spirit, the morale, the motivation and mental health of the men in armed forces.

MORALE

MORALE is the greatest single factor which contributes to victory. The story of a handful of Indian soldiers, who, when surrounded by an enemy overwhelmingly outnumbering them, at Saragarhi, went no fighting to the last man, without giving any thought to saving their lives by surrendering, is too recent to be forgotten. Many similar examples of exceptional bravery of soldiers under our national heroes are recorded in Indian history and are source of pride for all of us. Village bards sing their praise at the time of seasonal fairs in the Punjab, Rajasthan, U.P., Maharashtra and other parts of the country which serves as a source of inspiration to the young and the old alike. Similarly, the Russian soldiers defending Stalingrad withstood fierce German assaults from siege guns and systematic bombing for three months and never surrendered. It is well known that the Japanese soldier would willingly sacrifice his life by 'harakiri' rather than surrender. The average Indian soldier is in no way inferior to the fighting man in any other country. In fact our jawans have built up a very high reputation all over the world for their fighting qualities and officers and men from other armies

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who have either had the opportunity of being associated with them as allies or had to face them as enemies are full of praise for their bravery. But there is no magic formula by which a high morale can be infused into the troops. A good morale is based on multiple factors which serve as its foundations and requires a long time to be built up.

To be able to maintain the high reputation of our army and to enhance it, it would be necessary to examine the factors which are required to inculcate that attitude of mind—or that degree of morale—which helps one to continue fighting even in most adverse circumstances and also those factors which undermine such an attitude. But before coming to this important matter, it might be worthwhile to study briefly the motivation of the men who, at present, seek recruitment in the armed forces and the attitude of the general public towards the man in the services. It would also be useful to consider the stresses which our men have to undergo both in peace and war.

MOTIVATION

According to the current values and aspirations of the educated young people in India, soldiering as a profession is not considered to have a sufficiently high status to be in the first preferences among the desired careers; also with the increased avenues for comparatively more remunerative employment in industry, it is either the illiterate or semi-literate men, who as they are unable to secure better jobs outside, form the bulk of the people seeking recruitment as soldiers. The motivation in a vast majority of such cases, is mere economic necessity, although it cannot be denied that nobler motives like patriotism and service of the motherland did play a significant role in a large number of recruits who offered their services soon after the breakout of hostilities on our northern border in late 1962 and again in 1965 and 1971.

ATTITUDE OF PUBLIC

The attitude of the general public towards the men in the services during peacetime is by and large one of indifference, although at the time of the Chinese aggression in Oct 1962 and in the Indo-Pakistan Wars of 1965 and 1971, when the feelings of people all over the country had been aroused, there was an appreciation of the role of the men in uniform, but unfortunately these feelings were shortlived. There is no voluntary non-governmental organisation, unconnected with the services, working for the welfare of the soldiers and their families. The attitude of the civil officials especially at the lower levels also leaves much to be desired. The soldier approaching them on personal matters does not receive much help, sympathy or consideration and is apt to feel frustra-

ted. He also feels that before independence servicemen received a much better treatment from civilian officials and does not understand why their attitude has changed.

STRESSES MET WITH IN ARMY

There are many stressful factors, entering into the life of a young man choosing the army as a career. Some of the important ones are : Sudden and complete loss of emotional support which he was receiving from his family ; regimentation and being ordered about by his non-commissioned officers ; strenuous physical demands ; lack of privacy ; frustrations of various types ; not being able to attend to domestic problems immediately when his presence at home is considered necessary ; uncertainty about the next posting, and being stationed at places far away from home and with unfavourable climatic conditions. Service in field areas during an emergency involves more severe stresses like danger of being killed, injured or captured by the enemy, terrific noise, fatigue, lack of sleep, absence of physical comforts like hot food, facilities for bath, adequate and wholesome water supply, exposure to uncongenial climate, isolation, irregular and unsatisfactory arrangements for mail resulting in nonreceipt of news from home, and inability to go home on leave when he considers it extremely important to be with his family and relatives.

The capacity to withstand such stresses varies from person to person but it should be understood that everybody has his breaking point although the threshold is different in different persons. Many soldiers who had been decorated for gallantry in action have been known to suffer from psychiatric breakdown in a subsequent action. A study of cases of suicides in the army revealed that domestic problems were responsible for a large number of suicidal attempts. Similarly investigation into the possible precipitating factors of psychiatric breakdowns in the armed forces also revealed that domestic factors were the most important causes leading to such breakdowns. It may therefore be concluded that the average soldier, who may be able to withstand stresses of various kinds for a long time is more sensitive to bad news from home and also to a suspicion about something having gone wrong with the people at home. On account of the prevalence of joint family system in India our Jawans are probably more sensitive than their counterparts in other armies to anything which leads even to a suspicion of an insecurity on the home front. Besides the normal affection for parents, brothers and sisters and one's wife and children, the average Indian soldier has also got a great emotional attachment with several of his distant relatives e.g. uncles, aunts and cousins and considers that he should be present in his village at the time of the illness, marriage, or death of such relatives. Some of his officers may not understand the urgency of his request for leave on such an occasion.

To experience fear in the face of danger is universal and is nothing to be ashamed of. It is quite different from cowardice. High personal morale, good training and leadership in a well disciplined group will provide sources of strength which will enable a soldier to control his fear and do his duty.

FACTORS PROMOTING MORALE

Morale is "faith and courage, devotion to the nation, desire to live for it and if necessary die for it". It is based on both individual and group factors. The factors which promote a good morale are : good physical and mental health; confidence in oneself, in the leaders and in one's skill to use one's equipment and weapons effectively; contentment; belief in the rightness of the cause for which he is fighting, self-respect and belief in the importance of his own role in the achievement of the objectives; identification with the group i.e. the unit/formation of which he is a part and a sense of pride in belonging to it—*esprit de corps*. A fatalistic religious attitude, which is quite common in our soldiers, about the pre-determination of important events like birth and death and the protection which the Supreme Being affords to all of us, is very helpful in the upkeep of morale. Individual and group prayers are beneficial. Facilities for recreation and group games, interest in worthwhile hobby and a sense of humour are also important for a good morale.

FACTORS LOWERING MORALE

The soldier is unhappy and his morale is lowered if domestic worries continue to assail him particularly when he is unable to deal with them. He is discontented when his work gets no recognition or appreciation. He is emotionally upset when he has no confidence in himself or his leaders. He feels insecure if he has a reason to believe that military intelligence or equipment, numerical strength or support by other arms e.g. air support of the formation with which he is serving, is inferior to that of the enemy, and also if his confidence in his officers is shaky. He has very little incentive to continue fighting if he is not convinced of the rightness of the cause for which he is fighting or when he has a suspicion that his seniors are not genuinely interested in his welfare or that they are not strictly impartial in assigning unpleasant tasks or in considering people for promotion or in the grant of leave. His morale is also lowered if the period of turnover is uncertain, or if he is not sure of the efficiency of the medical services, and if he is subjected to prolonged non-battle fatigue and exposure to inclement weather conditions which he believes could be avoided. It should also be borne in mind that morale

is not a constant state and is thus subject to fluctuations. It requires constant *vigilance* and nurturing to maintain it at a sufficiently high level.

MORALE OF OFFICERS

(a) The morale of officers is equally important, if not more so, and demands a good deal of attention. If an officer of a fighting arm is disgruntled he cannot be expected to lead his men successfully in the battlefield. Similarly the state of morale of officers of services like the medical services is highly significant.

(b) The disparity of promotion between different arms and services has led to a good deal of discontent. To quote an example, it is not uncommon to find a highly qualified doctor, who is considered to be among the top men of his profession in India, and may even have a high reputation abroad, to be two or three steps junior in rank to an infantry, engineer or EME officer who had actually joined the service several years after the former. The structure of the army being rank-based, such a state of affairs cannot be conducive to a high morale and needs to be looked into. The efficiency of the medical services being an important factor in determining the morale of the fighting men, the state of morale of doctors themselves becomes doubly important. It may also be mentioned that the disparity of the scales of pay and chances of promotion between the officers of All-India civil services and the armed forces is another source of possible discontent which requires consideration.

(c) It is sometimes forgotten that the welfare of junior officers also requires looking after.

(d) An officer is required to spend a lot of his time in doing paper work to the detriment of his professional work. This is likely to lead to an impairment of his efficiency and thus to a lowering of morale.

(e) There is a tendency to hold an officer commanding personally responsible for a lot of things without a real authority to take a firm decision as his decisions even in day-to-day problems are not always upheld by higher authorities. This leads to a lot of frustration.

SUGGESTIONS

Recruitment, Army cannot be considered as a charitable organisation to provide jobs for those who cannot secure employment outside. The defence of the country being an extremely important duty we should

select only those who are best suited and motivated for the profession of soldiering. To be able to do so it is very essential that in our schools and colleges proper emphasis should be given to the patriotic duty of everyone to defend the motherland. This education should be given in such a way that our young people begin to consider it a privilege and honour to serve in the armed forces. These sentiments should also be mobilised in the minds of the general public by every means at our command e.g. through the mass media like newspapers, movies and radio, also through lectures by national leaders and distribution of suitably prepared literature. Psychological selection methods should be used extensively for the selection of Other Ranks as has been done for the officers. We must do our best to fit square pegs into square holes.

Procedure of weeding out unsuitable recruits within the first few months of their training requires simplification.

Institution of chairs in Military Science at different universities and encouraging students to take up this subject for higher studies.

- (a) Formation of a Directorate of Morale at the Army Headquarters with a highly experienced officer at its head and having a team of psychologists, sociologists, psychiatrists and educationalists, who could constantly study the state of morale in different formations, arms, branches etc, and to devise methods to promote a high morale. As mentioned above, constant vigilance and efforts are required to maintain the morale at a high level and these efforts cannot be slackened at any time. This directorate should continuously study the state of morale of all arms. Morale indices, such as incidence of crime, preventable diseases like venereal diseases, accidents; self-inflicted injuries, psychiatric cases and suicidal acts, should be constantly studied. Opinion surveys and investigations should form an important assignment of this directorate. The officers commanding of different units should be encouraged to inform the directorate of the true state of morale of officers and men under them and their opinion about the causes of a lowering of morale which may be discovered. They should be assured that there would be no risk of anyone being taken to task. Such a fear, it is considered is responsible for the units giving a stereotyped report of "high morale" in their intelligence report.
- (b) Such studies by the Directorate of Morale are expected to discover better indices of the state of morale as well as means of promoting it. *Psychological warfare* would be an appropriate subject under this directorate.

In the training centres and units, besides the usual facilities for recreation and games, encouragement should be provided for developing individual hobbies. Groups and clubs should be formed. Exhibitions and displays of the products of amateur workers should be organised and talents given due recognition. Assistance and encouragement should also be provided for organising patriotic plays. Emphasis should be laid on the teaching of military history including the lives of great soldiers of the past and present. Every effort should be made to inculcate a sense of pride in the unit and regimental traditions.

Encouragement should be given for regular attendance at places of worship. The religious teachers should also be trained to give counselling to individual soldiers having personal problems. The services of religious teachers should be made available to all soldiers, including those in forward areas and also those who are ill in hospitals. The religious teachers of various faiths and demoninations could have their headquarters with a formation HQ and pay regular visits to different units in their areas.

It might be worth considering whether different regiments could not be renamed after the names of the national heroes in our ancient history e.g. Rajputana Rifles, Punjab Regiment, Maratha Light Infantry and Sikh Regiment, might be appropriately named Maharana Partap Regiment, Ranjit Singh Regiment, Shivaji Light Infantry and Nalwa Regiment, respectively. The association of the names of such great leaders with different units will go a long way to promote a sense of pride in the men serving in these units.

The indoctrination of hate against the enemy is not desirable. Resentment against the enemy is important but love for country, leaders, unit and comrades is a much more powerful stimulus for fighting. The indoctrination of hate against the enemy is not likely to have permanent effect on account of our cultural background.

Adequate secretarial assistance should be provided to officers in carrying out their duties, so that they can spend more time in doing their own specific jobs.

Gradual and adequate acclimitization should be ensured as at present in the case of troops required to serve in high altitudes and other places having uncongenial climatic conditions. Adequate 'battle inoculation' of all ranks before they go into action is an important step.

Voluntary non-governmental organisations should be formed at the Centre and in the States with branches as far down as the taluka or tehsil level, who should look after the welfare of the services personnel as well as ex-soldiers. To improve the sense of security of the servicemen

it is essential that retired officers and men receive better treatment. It will be useful to improve the terms of pension and other privileges from time to time. Proper rehabilitation of ex-servicemen is an important morale promoting factor.

Incentives. Exceptional merit and efficiency should no doubt receive recognition by out-of-turn promotion but there should be some known criteria for selecting individuals for promotion to higher ranks. It is necessary that strict impartiality is ensured in this matter but it is also equally necessary that all concerned are convinced of such an impartiality. There is nothing more demoralising than the suspicion that considerations other than merit have entered into any such promotion. Other incentives like cash awards, and certificates of merit should be instituted in suitable cases. Institution of many more medal ribbons than is the case as present is also worth considering. Napoleon is reported to have said "Give me enough ribbons to place on the tunics of my soldiers and I can conquer the world." Words of praise and commendation, where due, should not be spared in day-to-day work. Men should be made to feel that their work is important and that it is appreciated by their seniors. No body should be humiliated or belittled in front of others. When a rebuke is necessary it should be done in private. It should also be made clear that it is the wrong act that is punished, not the man.

Ventilation of grievances and easy methods of redress are extremely important and should be given due consideration by commanders at all levels.

Communications. Arrangements should be made for prompt delivery of private mail. It is worth considering whether a network of medium-wave broadcasting stations within the listening range of our forward troops could be set up. Special programmes for the fighting troops could be organised under army arrangements.

As much information as possible, which is compatible with security, about the objectives of commander should be passed on to the men. This step is necessary to build up their confidence in their officers as well as their self-confidence and self-respect. It will counter the spread of rumours.

The efficiency of medical services should always be kept at the maximum and steps taken to build up the confidence of the soldiers and their families that they will be looked after by best doctors and nurses if and when necessary.

Preventive psychiatry. Mental health consultation teams consisting of psychiatrists, clinical psychologists and social workers should be formed for consultation with officers and NCOs in forward areas with regard to

the mental health problems of their men. Such teams are doing excellent work in the USA and it is high time that a beginning is made in our country too. Their aim is to prevent or reduce the incidence of mental breakdown and to treat cases of minor maladjustments as outpatients without admitting them to hospitals. The members of these teams are also available for consultation with the Commanders with regard to the upkeep of morale.

Administrative instructions should be issued by the State Governments to the civilian officials to show utmost consideration in expediting decisions in cases involving soldiers and their families.

SUMMARY

Toughening of the mind or a high morale is that attitude of mind which enables one to continue fighting even in most adverse circumstances and in the face of grave danger to oneself.

There is no simple formula by which this state can be induced because it is based on multiple individual and group factors and requires a long time to be built up.

The individual factors include : good physical and mental health, a happy home life, motivation for service, skill in the use of one's weapons and equipment, self-confidence and self-respect, contentment, confidence in one's leaders and in the righteousness of the cause for which he is fighting, a religious attitude and sense of humour.

The group factors include : attitude of the general public towards the armed forces, organisation of proper selection methods, adequate training, appreciation by Government and people, role of non-governmental voluntary organisations, methods of ventilation and redress of grievances, ensuring strict fairness and impartiality by seniors, provision of suitable incentives, avoidance of non-battle fatigue, morale of leaders, facilities for recreation, development of hobbies and religious worship, and availability of efficient medical services etc.

Morale or 'toughness of mind' is an acquired state and is subject to waxing and waning. It therefore requires constant vigilance and nurturing to maintain it a high level.

Some suggestions have been made to inculcate such a state. These include : institution of a Directorate of Morale, study of disparity of promotion in different arms and services, extensive use of psychological selection methods for recruitment of ORs, education of the general public, institution of chairs in military science in universities, provision of incentives, formation of mental health consultation teams for work in forward areas, better arrangements for prompt delivery of private mail, and institution of a medium-wave broadcasting network within listening range of forward troops.

SOME 'IFS' OF HISTORY

Wing Commander P.K. KARAYI

A LARGE segment of people believe that everything that happens in this world is pre-ordained. To the rationalist this attitude is not acceptable as it negatives the entire purpose of human life. Even astrology, contrary to what most people believe, does not profess to be a philosophy of pre-destination. An individual born under Capricorn or Cancer may have qualities or a temperament specific to his astrological configuration but his future still depends entirely on the exercise of his free will. Anything that happens cannot therefore be considered as inevitable. It would be equally incorrect to assume that important events and movements in the world are pre-ordained. Chance has played an important part in human affairs. There are several events in the history of the world where perhaps with a slight change in the circumstances or a different leader at the helm of affairs, the shape of subsequent history might have been altogether different.

To students of "creative history" this is a subject of perennial interest and conjecture, an intellectual exercise that can be both stimulating and interesting. What, for instance, would have been the impact on history if Napoleon had won the Battle of Waterloo? If Hitler had launched "Operation Sea-Lion" against England immediately after the fall of France and it had been successful, to what extent would it have affected the subsequent course of events? Or again if Hitler had discovered the atom bomb in those crucial days of 1945 would the Normandy invasion have been a success? Coming closer to home, if the 1857 Revolt had been a success to what extent would it have affected the subsequent history of this vast sub-continent. These are merely a few of the many events in the fabric of history which can be subjects for speculation and controversy. From time to time the discovery of diaries, official records, statements by men who mattered results in new light being cast on various aspects of history injecting the subject with a fresh spurt of interest and controversy. Perspectives change; recorded history has to be rewritten. Contrary to what most people imagine, History cannot be considered as a dry-as-dust chronicle of past events. Its a record of human aspirations and achievements involving major decisions which had a tremendous impact at the time and on subsequent events.

BLUCHER'S LUCK

Take the Battle of Waterloo for instance. With defeat and disaster staring Wellington in the face it was the timely arrival of Blucher which

saved the day for the Allies. And yet had it not been for a spot of luck, 73-year-old Blucher would not have lived to see the Battle of Waterloo. Two days earlier riding at the head of Roders Cavalry, Blucher charged the French Guard. He was unhorsed and injured and was saved only due to the presence of mind of his aide-de-campe Nostiz. This apart, several military historians feel that if Napoleon and Berthier as his Chief of Staff instead of Soult and if instead of Grouchy he had given the command of the right wing to Suchet, it would have resulted in an overwhelming victory for the French. Then again after Blucher's centre was shattered at Ligny if only D'Erlon had attacked from the rear, as planned Bluchers entire force would have been annihilated. This would have eliminated Prussian interference and Waterloo would have been a decisive French victory. Despite these sequence of events even on the final day it was General Grouchy's failure to join the main French army on June 18th and Marshal Ney's precipitate cavalry charge which influenced the outcome of the final battle. On the eve of the Battle of Waterloo Napoleon is reported to have said: "After a battle like Ligny it is impossible for them to join forces. If my orders are carried out we shall sleep in Brussels." Napoleon's tragedy is that his orders were misunderstood and not executed by his Generals, apart from lack of initiative on part of his Generals which tilted the balance in favour of Wellington. Waterloo will continue to remain one of the big "ifs" of modern history.

Looking back in retrospect to the events in Europe leading to September, 1938 it was primarily the indecisiveness of Chamberlain and the Daladier Government which paved the way for Hitler's annexation of Sudetenland from Czechoslovakia. According to the Russo-Czech Pact of 1935, both Russia and France had promised support to Czechoslovakia in the event of armed aggression. Documents prove that Russia was keen to contain German expansionism but Chamberlain and the French Cabinet were set upon a policy of conciliation. From the official records it transpires that Benes was prepared to fight for a period of two weeks at least, provided he could rely on military support from England, France and Russia. This was not to be, as Chamberlain was not prepared for a dialogue with the Russians. The sacrifice of Czechoslovakia was therefore a foregone conclusion. If, on the other hand, instead of Chamberlain, Churchill had been in power at this crucial stage of history it is more than likely that his farsightedness would have rallied all the European powers to present a joint ultimatum to Hitler. If despite this, Hitler had decided on Armageddon, with simultaneous hostilities on four fronts, Germany would not have stood a chance. It would have resulted in a short, swift campaign. The rape of Czechoslovakia would never have occurred. The Allies could have removed Hitler from power and the world would have been spared the carnage and holocaust involving the sacrifice of millions of lives on the altar of Mars.

MUNICH AGREEMENT

In the same context with Churchill as the leader of the British Cabinet, Hitler's subsequent aggressive designs against Poland would never have materialised. Churchill despite his aversion to the Bolsheviks, the wise statesman that he was, would have signed a pact with the Russians. With an ultimatum from a three-power entente composed of England, France and Russia, Hitler would not have been foolhardy enough to embark on a campaign against Poland. The available records from the British archives prove that Churchill and Lloyd George were positive that Russian co-operation was essential to bring a halt to Germany's excuse of "Lebensraum". The vacillating attitude of England and France however convinced the Russians that the Western Powers were seeking to divert German expansion towards Eastern Europe. This surmise was supported by the Munich Agreement and the talks in Paris between Bonnet and Ribbentrop. The tragic sequel which drove Stalin into signing the Non-Aggression Pact with Hitler on August 21, 1939 is an event which could have been averted by wise statesmanship and political foresight.

After the fall of France, what were the chances of success if Hitler had undertaken an invasion of England? Plans for "Operation Sea-Lion" had already been chalked out by Hitler involving an invasion force of thirty-three battle-trained divisions and six armoured divisions. Considering the shape of preparedness in England and with German generals of the calibre of Rundstedt, Rommel, Manstein and Guderian, the chances of the invasion being a success was almost a certainty. This is one of the major lapses in Hitler's strategy. If "Operation Sea-lion" had become a fait accompli German hegemony in Europe would have been complete. With England eliminated, the Normandy invasion and American participation in the war would have been non-effective. With a short break for rebuilding his forces, Hitler could thereafter have annihilated Russia without any semblance of a threat on the Western front. In fact if the Germans had come to an agreement with Japan to simultaneously open hostilities on the Eastern front, the annihilation of Russia would have been a foregone conclusion. Stalin was farsighted enough to realise this and signed the Non-Aggression Pact with Japan on 13 April 1941. Yosuki Matsuoka, the Japanese Foreign Minister, had preliminary discussions with Ribbentrop on 29 March 1941 and subsequently with Hitler. The Germans apparently missed the boat. Hitler did not mention a word about the Barbarossa Plan though Matsuoka shrewd diplomat that he was, had advance information about the German plans against Russia. The Japanese Foreign Minister did make an oblique reference to this during his discussions with Ribbentrop which however did not register on the Foreign Minister of the Reich. The subsequent discussions with Stalin, the guarantee of Soviet concessions to the

Japanese culminating in the signing of the Non-Aggression Pact is now a part of recorded history. This was one of the major diplomatic milestones in the Second World War where the entire credit goes to the statesmanship of Stalin. For the Japanese it guaranteed Soviet neutrality in allowing Nippon a free hand in South East Asia. The Russians were confident that this would minimise the risk of German aggression but if hostilities became inevitable they were secure from any threat from the Eastern Sector.

NORMANDY INVASION

However accepting the course of events as they occurred yet another big "if" is the Normandy invasion. If Japan had opened hostilities against Russia the Germans could have annihilated the Russians without difficulty. The Germans would then have been in a position to divert adequate troops to strengthen the forces at Normandy and its environs. Even otherwise we all know that there was a sharp difference of opinion between Rundstedt and Rommel as to how they should fight back a prospective Allied landing at Normandy. In the postwar study of the Normandy invasion many military thinkers have opined that if Rommel were given a free hand he might have succeeded in inflicting a strong counter-attack and annihilated the invasion forces before they could gain a foothold in Europe.

From the German archives there is reason to believe that Hitler was on the verge of producing the atom bomb. If he had succeeded in this project Hitler could have been master of the world. The annihilation of England would have been a certainty, and perhaps an atomic bomb on New York with its skyscrapers could have brought America to its knees. This surmise is supported by the fact that both in the field of nuclear weapons, rocketry and launching into space the Germans have been the pioneers. Immediately after the war both the Americans and Russians in a mad scramble moved German Scientists and equipment lock, stock and barrel to their respective countries. The subsequent advent into space-travel and the landing on the Moon is primarily due to German research and acumen.

Coming closer to home, in the post-Independence period a great deal of research has been carried out into the historical records relating to the 1857 Mutiny. Had it not been for a few undermining factors the Mutiny would have resulted in the termination of British rule in India. What the British historians have ignominiously labelled as a "Sepoy Mutiny" or a mere insurrection was in actual fact a War of Independence—a war devoid of the canker communalism where Hindus and Muslims made common cause to drive out the foreign exploiter from Indian soil. Unfortunately the Revolt did not have the backing of the

entire country. The Sikhs and the Gurkhas fought for the British. Punjab, Sind, Assam, Nepal, major parts of Rajasthan and Bengal did not rise in revolt. The revolt did not spread to Southern India. Most of the vested interests and several princely States aided the British both with troops and supplies. In fact the Nizam's troops under Brig. Stuart stormed Dhar and it was the supply of provisions by Sikandara Begum which helped Sir Hugh Rose to defeat the rebels in Central India. The rulers of Jaora and Bhopal acted as fifth columnists, not to mention many other lesser potentates who did likewise. The great Tantia Tope was betrayed to the gallows by his own friends. While Nana Sahib, Tantia Tope, Saadat Khan, Firoz Shah, Bakht Khan, the Rani of Jhansi achieved an initial success and sacrificed their lives in the national uprising there were several like Jayaji Rao Scindhia, Sir Dinkar Rao, Rao Sahib Reshimwale, the Nizam and Sikandara Begum who betrayed the national cause. Petty jealousies and rivalries, vested interests, warring factions, old feuds and lamentable lack of a concerted plan among the rebel leaders were the main causes of the failure of the revolt. Those with vested interests betrayed the secrets of the rebels to the British and helped them to suppress the revolt. It was the British policy of "Divide and Rule" which eventually resulted in the failure of the revolt. There was a lurking fear among the vested interests that the withdrawal of the British would lead to chaos. Yet considering the fact the revolt lasted a period of two years it is more than likely that with good generalship and a proper plan of action and the unequivocal support of the entire country, the 1857 War of Independence would have resulted in the expulsion of the British from India. This is one of the big "ifs" of Indian History.

Assuming that the revolt had been a success, India would have had a lead of over a century during which she could have taken advantage of the Industrial Revolution and established herself in the comity of nations. For one thing the partition of the country would never have occurred and as the leading nation in Asia she could have been a foil to Chinese expansionism.

The recent history of our country during the decade before we attained Independence as well as the post-Independence period has certain events which have been the subject of argument and controversy. Could we have avoided the partition of the country? Many people feel that if Gandhi, Nehru and Patel had recognised the calibre of Mohammed Ali Jinnah and handled him with an eye on the future, the partition of the country would not have occurred. Gandhiji considered the Ali brothers, Dr. Ansari, Abdul Ghaffar Khan and Maulana Azad as the leaders of the Muslims. Even the British had no time for Jinnah who in their eyes was a liberal. It was this sense of frustration that resulted in Jinnah retiring from politics and for a while he practised as a lawyer in

England. And yet we should not forget that at the Round. Table Conference in London in 1930 it was Jinnah who spoke eloquently of India as a Dominion and not two separate Dominions. It was only with his return to politics in the period from 1937 to 1939 that Jinnah as the leader of the Muslim League advocated the creation of a separate Muslim State. Intellectually Jinnah was above the rest of the Muslim leaders and given adequate importance in the Congress fold to which he initially belonged, the partition of the country could have been avoided.

Henry Ford is once reported to have said that "history is bunk." No right thinking individual would subscribe to this theory. History is a multi-casual, complex process in which many factors, often accidents, have played decisive roles. Its course is dictated, not only by political events but also by the trend and impact of ideas through the centuries. It is an appreciation of the impact of these diverse factors in history and the possible outcome of events which can make a study of history really meaningful. History is not the dry as dust narrative of events which is taught in most of our academic institutions. The Barque of Clío has perforce to steer a difficult course between the Scylla of recreating past events and the Charybdis of a mere mathematical narration of facts. The historian should be a creative artist and deftly paint a picture of how events occurred, the diverse factors that influenced those events and how the flow of history could have been different under varying influences and circumstances. It is in this context that the "ifs" of history lend a creative touch to this ever-absorbing subject.

AN APPEAL

USI JOURNAL

JAN-MAR 72

& JAN-MAR 73

The above issues of the USI Journal have unfortunately gone out of print but are in frequent demand from subscriber members/unit libraries to complete their volumes. Members are therefore requested to donate one or both the issues for the benefit of such libraries if they no longer require these issues of the Journal.

BOOK REVIEWS

A WORLD OF NUCLEAR POWERS ?

by Alastair Buchan

(Published by Prentice-Hall, New Jersey, 1966) Pp 176 Price \$ 1.95

SINCE the Second World War, four more countries have joined the group of nuclear powers along with United States of America. Besides, a larger number of countries have the potential to manufacture atom bombs and can go ahead once decided by the respective ruling elites. But with the spread of nuclear weapons there is no doubt about the fact that the World is being threatened by a precarious balance of power. So the need of the moment is greater realisation and rational thinking by all the countries, about the intensity of devastation caused to humanity with the spread of such a deadly weapon. That's why any literature which creates the spirit of introspection in us is welcome. The book under review exactly fits into this category.

It is basically divided into five parts with a brilliant introduction by Alastair Buchan, who is professionally best suited for the same. The editor makes us realise about the importance of regulation and control on the spread of nuclear weapons. He is also critical about the inconsistent approach taken by the nuclear powers. He makes some tentative comments on the issue of proliferation and its impact on international politics. Especially he strongly feels that "a new uncertainty would inevitably be introduced into the conduct of international politics by the rise of new nuclear powers, independent of the effect upon the super powers". (p. 7). He logically explains the positions taken by non-nuclear nations on the issue of non-proliferation.

Leonard Beaton concentrates his major attention on the technicality of making bombs from Uranium and Plutonium and the capacity to manufacture and involve a delivery system by each of the twelve potential nuclear powers. He is of the opinion that countries with powerful and developing civil economies will inevitably be improving their capacity to produce delivery systems for nuclear weapons (p. 37).

In the second part intellectuals from four countries—Germany, India, Sweden and Japan—throw light on the economic, psychological and moral implications of manufacturing bombs in their own land. Advocating the case of India, Sisir Gupta emphasizes that the cost of the required programme, the Indian stake in promoting the stability of the world political system, the widely shared moral aversion to nuclear weapons, the social objectives and the political values of India, and the pattern of her foreign relations will remain strong disincentives to an Indian nuclear weapons programme (p. 67)

Stanley Hoffmann, with his deep insight into the dynamics of international politics discusses the pros and cons of becoming nuclear and

its possible impact on the status quo. Lord Chalfont, with wide experience in the field of disarmament, makes an honest attempt to bring about an understanding amongst major powers on the issue of arms control and emphasizes the non-military use of atomic power.

Urs Schwarz, in the concluding chapter, sums up the positive role to be played by the non-nuclear powers in the furtherance of international peace. He strongly suggests three basic steps towards non-proliferation i. e. Non-Nuclear Zones, Inspection and Nuclear Neutrality. Nuclear Neutrality being a bold step, according to the author, "would confer on the States a much stronger and independent position than the adhesion to a system of disarmament and arms control practically dictated by the great powers. (p. 163). On the whole all the chapters are complementary to one another. It was expected that the editor would have included a Select Reading at the end.

P.K.M.

WAR AND SOCIETY: HISTORICAL ESSAYS IN HONOUR AND MEMORY OF J.R. WESTERN 1928-1971

M.R.D. Foot

(Published by Paul Elek, London 1973) Pp—342 Price £5.75

THIS is an anthology of social essays which establish the certainty of linkage between war and society. Such a mutual relationship would not be surprising, as war is an eruption of deep-seated social maladies. This relationship forms the central theme of the book. The editor has done well to establish his view point by choosing essays covering a period of over two thousand years.

To gain full benefit, the reader should have a sound knowledge of history. As an example, take the essay on 'Privateers in the Ancient Greek World'. Such plunderers of fortune, freely offered their services to the belligerents, throughout history. But only a reader with depth of learning in ancient Greek and Roman histories would be able to discern the startling similarities between the Privateers of those days, and the modern Palestinian guerrillas.

The impact of religion and morality on the military is fairly well known. Perhaps faith is the most single potent factor in the make-up of a fighting soldier. The Gita, Bible and Koran have made many good military leaders, and changed the practices of war. It is for this reason that the highest emphasis is laid on the religious and political beliefs of officers and men. In the Victorian British Army, ultra-English and non-English regiments were balanced, based on Protestants and Catholics. The Communist countries have political commissars to monitor their armed forces. Many in Britain took the 1857 upheaval in the Indian Army as a war against Christianity. Religious institutions have been responsible for the synthesis of medicine and humanities with the practices of warfare. Even the earlier 'Soldiers Homes' in Britain were promoted by such institutions.

The essay on "Britain, India and the War of 1914-18" is of special interest to Indian readers. It is now generally accepted that after the First World War, (in which medieval Indian lethargy was rudely shaken by the expanded mental horizons of tens of thousands of civilians and soldiers), Britain had no option but to concede increased 'Home Rule'. The British power rested on three legs : socio-political, religious and military. The British fully exploited the manoeuvrability and flexibility afforded by this arrangement. Many other colonial countries depended for their hold on the military only. It may look a far-fetched idea, but the First World War let in motion many social forces which made the end of colonial rule inevitable. The Champaran struggle, which brought Gandhiji on to the forefront, was triggered off by a famine, which was caused by the railway's poor performance, which in turn was due to its preoccupation with the War effort.

Coming to more recent times, the book has informative essays which reveal the sick societies of Germany and Japan. It was their compulsions which brought forth the Second World War. All told, this is an interesting book. I wish the editor had given a more comprehensive 'Introduction'. Without greater elucidation a casual reader may not be able to appreciate the reasons for including certain essays.

T.N.R.N.

CONSCIENCE AND POLITICS.

By John Rae.

(Published by Oxford University Press, London, 1970) Pp 280 Price £ 3 50.

THE British Government under Prime Minister Asquith drifted into conscription in January 1916. The Military Service Bill which became law on 27 January and came into operation on 10 February contained, inter alia, a provision for exemption "on the ground of a conscientious objection to bearing arms." The Military Service Tribunal could exempt applicants on conscientious grounds from combatant duty only. The intention was obviously to ensure the availability of the services of conscientious objectors for performance of duties not involving direct carrying of arms. What had not been clearly foreseen was that conscientious objections could be on religious, political, ethical or intellectual grounds.

It was thought that the Military Service Bill would automatically provide the Army with sufficient men. But in terms of the numbers involved it appeared that the Bill did not so much make military service compulsory as it made exemption, for example, whereas 371,500 men were compulsorily enlisted, as many as 779,936 men had been exempted from service by the tribunals. The military authorities had expected that law would relieve them of and anxiety about the monthly recruiting figures. On the contrary they now had to compete for their share of manpower not only against the demands of the civilian departments but also against legitimate personal claims for exemption. The ambiguities of the law and limitations of the exemption procedure had thus tended to defeat the aim of the Bill.

The conscientious objectors ranged from those who would only not bear arms to those who refused to cooperate with the prosecution of the war in any way. In between came those who would bear stretchers or even make munitions. Dr Rae has surveyed vast materials in drawing up an objective account of conscription and discussing the relations between the contentious objects and the British Government. He deals with the Christadelphians, Quakers, Plymouth Brethren, Jehova's witnesses, Seventh Day Adventists, Anglican Pacifists, Beeston Brotherhood as also unidentified religious groups. The Independent Labour Party which was the most fertile source of political objection thought that conscription was "the thin end of the wedge of czarism". Then there was the British Socialist Party which found itself on the horns of a dilemma. Socialist theory was not easily reconciled with resistance to a law that embodied both the will of the majority and the principle of State control. The author ably discusses the conflict caused by this question within the socialist movement, when there was a marked division between the opponents and supporters of war.

The toughest lot were of course the Absolutists who refused to undertake alternative service as a condition of exemption. They numbered 985 and from the summer of 1916 until their finals release they endured repeated terms of imprisonment. The case of Stephen Hobhouse, the influential Quaker, has been treated at great length.

The rich detail in which politics behind the Military Service Bill and the resulting confusion in treatment of the conscientious objectors have been brought out by Dr. Rae makes the book an excellent historical study of this problem faced by the freedom-loving British.

V.J.M.

THE YOUNG LLOYD GEORGE.

By John Grigg.

(Published by Eyre Methuen. London, 1973) Pp 320 Price £ 4.50

THE author paints the portrait of a man who, from a tender age, developed the strong ambition which was to take him to the political summit. The basic strategy Lloyd George adopted to achieve his purpose is revealed and commented upon.

Lloyd George was a proud Welshman and he made his political debut as a champion of Welsh causes. This assured him a constituency and a following which not every politician in Britain could attract. To this was added the shrewdness, eloquence and charisma he possessed—all powerful factors in capturing Welsh votes. Once firmly in the saddle, he showed a diminishing regard for his constituents as individuals, but was careful to crusade vigorously over general constituency issues involving his voters collectively. His tenacity and skill in achieving success in these matters sustained the loyalty of his supporters.

He was a fine speaker, capable of holding mass audiences enthralled as well as of making his point effectively in Parliamentary debate. He prepared his speeches very thoroughly, often learning them by heart and using only a scrap of paper with the main points jotted on it.

During the phase covered by the book, Lloyd George was a Liberal. In the process advocating Welsh causes, he inevitably stood up for the common man, but this is not to say that he was fervently socialistic or egalitarian. Indeed, the author describes him as an "imperialist with a difference."

He vigorously opposed the Boer War and fought for Boer rights, but cared little for the rights of the coloured people including the Indians of South Africa. John Grigg that "he did not at heart fully accept the case for Indian self-government or rid himself of the feeling that coloured people were inferior." On two occasions he made passing references to self-government for India but they were pronounced in the context of his support for the burning topic of Irish Home Rule and his basic passion for asserting Welsh identity and Welsh aspirations for a better place in the sun.

Perhaps, the author speculates, he may have developed a more positively sympathetic attitude to Indian freedom if he had visited India, but that kind of speculation is, as the author himself confesses, a profitless exercise today.

Some aspects of Lloyd George's personal life are dealt with and, in sum, the book attempts to cast light on his formative years as a man and as a politician.

V.E.B.

WITH PAGASUS IN INDIA: THE STORY OF 153 GURKHA PARACHUTE BATTALION

By Eric Neild.

(Published by Jay Birch. Singapore) Pp 110.

THE book starts with a dramatic beginning, picturing the gruesome and hopeless situation in which the first ever Indian paratroops, formed during the Second World War, found themselves. The backdrop was provided by the hills and jungles of Burma, and the principle actors in this highpitched drama were the entrapped Indian paratroopers with the pursuing Japanese close on their heels. The paratroopers were ordered to fall back on Imphal, but the crucial question was whether they would be able to make it at all. The very first page, however, leaves the clear impression that even in this grim situation, when everything apparently appeared to be lost, the Indian paratroopers did not lose their sense of humour.

The first Indian parachute Brigade (the 50th Indian Parachute) developed around the nucleus of the Air Landing School (ALS), formed in October 1941, and consisted of the 151st British, 152nd Indian and 143rd Gurkha Parachute Battalions. The beginning was cheerless and none too promising; there was lack of equipment; and the necessary aircraft were totally wanting. The Battalions had their teething troubles. Some facts about the Indian (152nd) Regiment are interesting. It was recruited and composed unlike the Indian army, that is, not on class

basis. Like the RIN and RIAF, its personnel were recruited on a no-class, no-caste basis. Hindus and Muslims were separated owing to cooking difficulties. The Sikhs were debarred as they would not wear the regulation jumping-helmet.

It is interesting to learn from this book that the Parachute Brigade formed in India was learning its lessons from none other than one of its foes—the Germans. When the Mediterranean was closed and Malaya was being overrun, and India was almost cut off from its main peacetime sources of supply, and when even light-scale rations, such as chocolates, etc., were unobtainable, recourse was had to finding out what the Germans had done in such situations. At another place, the author states that one of the first things that his Brigade Major asked him to do was to look through what information they had on parachuting—and the information they had was copies of German operational orders for Crete and photos of a German parachute training school somewhere in Germany.

The difficulties encountered in forming the first Parachute Brigade are adequately reflected in certain interesting facts mentioned. For example, officers who made up the brigade staff were a "poor advertisement for parachuting"! Again, the Brigade Major was in the Brigade and ready to jump again though he had broken his back earlier. The Brigade Commander who had lost one eye in the previous war "was hobbling about on two sticks owing to a compound fracture of his leg following his last jump..."

The style is throughout gripping and graphic. For instance, the author writes at a place: "To speed our actions, we watched the Japanese pouring from over the hill down the road from Ukhurul. It was unbelievable—we might have been watching a stageplay from the dress circle." The author enlivens the narrative with numerous anecdotes. He also draws interesting pen-portraits of a number of protagonists of the drama. The interest of the reader is never allowed to flag.

The book is a valuable record of the 153rd Gurkha Parachute Battalion. It is a paper-back edition. It would have been better to bring it out hard-bound and in the normal book size.

KMLS

THE SPANISH ARMADAS

by Winston Graham

(Published by Collins, London, 1972) Pp 288 Price £ 4.25

ONE would have thought Winston Graham, better known as the author of suspense stories, incapable and utterly ill equipped to write a history of the Spanish Armadas. Elizabethan history comes sparklingly alive in this extremely well written and beautifully produced volume.

The narrative opens with a lucid and brief background of England before Elizabeth came to the throne. It describes the pomp and pageantry

with which Mary and Philip were married and how the foundations of a relatively stable relationship with Spain were laid. Subsequently it describes the widening chasm between England and Spain mainly due to extreme religious differences. There are delightful pen portraits of both Elizabeth and Philip. Further, Mr. Graham shows how Elizabeth always kept Philip at arms length by simultaneously holding out offers of marriage and helping Protestant rebels in the Netherlands who were fighting against Philip's tyranny.

So much for political history. The development of both the English and Spanish fleets is described in a most interesting manner. The well known episodes of Sir Francis Drake carrying out naval raids in the Spanish West Indies and his 'singeing of the Spanish king's beard' are retold with great detail and relish. Students of naval history will find this volume of immense value in that there are detailed descriptions of naval battles with the help of contemporary maps as also the relative strengths of both forces.

Perhaps in historical terms that the most important contribution of this book is to reinforce the fact that the history of sixteenth century Europe can be interpreted solely by the division of that continent into two opposed religious camps, the Protestant and Catholic. It also gives us an insight into the personalities and their formulation and conduct of foreign policies in contemporary Europe.

There is hardly any doubt that Mr. Graham has taken considerable pains in the production of this work. It would not be a gross exaggeration if it were to be called a work of art simply on the grounds that it contains some fabulous illustrations and coloured portraits. More such works on select events in history would be very welcome.

—A.T.

THE PAGODA WAR

by A.T.Q. Stewart

(Published by Faber & Faber, London, 1972) PP 223 Price £3.00

THE title is symbolic and hence somewhat misleading. It lends a romantic flavour to what was essentially a war fought in Burma to further British imperial considerations. The war was directed from India during the viceroyalty of Lord Dufferin of Ava in 1885.

Fortunately, Dr. Stewart's is a comparatively unbiased account. He has no pretensions to concealing events, motives and causes. In fact, he is consistently objective while examining them. His narrative reads easily and it is not very difficult for the observant reader to discern that it was unbridled British economic imperialism which was responsible for the annexation of Burma.

Historically, the Burmese war falls into a pattern. In Afghanistan England acted because of fear of Russian designs. In Burma she acted because of fear of Russian designs. In Burma she acted because of a fear that the French, operating from neighbouring Indo-China, would steal a

march over them in acquiring commercial interests in Upper Burma. This commercial jealousy is revealed very clearly by Dr. Stewart. With the help of viceregal correspondence he shows that there was a well-thought-out plan for the economic and commercial exploitation of Burma.

Dr. Stewart writes with a fair amount of detail. This is clearly seen in his chapter on the Times correspondents where he shows that tactless handling of Press correspondents by an overzealous bureaucracy can lead to endless trouble. In this particular case the merits of the Burma campaign were belittled in England and led to a countrywide outcry against the Government in India.

There is an interesting account of the Chinese reaction to British annexation. Burma was considered a subsidiary tributary State of China. The Chinese refused to acquiesce in the annexation and insisted that Britain either pay compensation or annual tribute. Ultimately this rather ticklish matter was resolved through diplomatic means without loss of face to either side.

Dr. Stewart has some delightful snippets from the private diary of Lady Dufferin. Quite clearly the Vicerene did not care particularly for Simla. Kipling, too, went up to Simla to describe for his paper "the annual spectacle of an Empire ruled from a remote and almost inaccessible village, seven thousand feet above the Indian plains."

Well-illustrated and documented, Dr. Stewart's book is a welcome addition to the knowledge we already have about the conduct of external affairs of the Government of India in the last quarter of the nineteenth century.

—AT

TALES OF THE MOUNTAIN GUNNERS

Edited by C.H.T. MacFetridge and J.P. Warren

(Published by William Blackwood, Edinburgh, 1973) Pp 327 Price £ 5.50

THE editors have compiled an absorbing and beneficial anthology of the annals of the Mountain Gunners. Their selections vividly convey not only a sense of history and gallantry, but also the nostalgic memories of a bygone chivalrous era. For posterity, what matters is not the mechanics of the science of warfare, but the subtle human touch of the past masters. The blood and sweat of many battles have been brought out by their participants themselves. A careful reader will be able to see through the idiosyncrasies of many colourful characters and appreciate their compassion, humanism and regimental spirit.

"Unique" is part of Artillery's motto, and without the generous contribution of the Mountain Gunners, the Regiment would have found it hard to come up to it. Thanks to this 'pick of the lot', no worthwhile battle has taken place without gunners. There could be no two opinions that artillery adds colour-both in peace and war. The red facing of the Mountain Gunners has acted as a morale-booster during many critical

situations whether they were in the NWFP, Tibet, Imphal or Jammu & Kashmir.

Historically, the Mountain Gunners had lived mostly in "tough" frontier stations. Such uncongenial surroundings have helped them, both to appreciate the nobler values of life, and learn the intricacies of their profession. Invariably, they have been physically and mentally sturdy and robust. No wonder, many from them have climbed to the highest rung of the ladder.

Alas, the long and passionate attachment between the Mountain Gunner and his animal stands threatened to be terminated due to the advent of helicopter. A great tradition of animal management and gun maintenance has emerged during the long and chequered history of the Regiment. It is a matter of faith with a gunner to attend to the comfort of his animal, and service his gun, before attending to his own needs. It was this carefully cultivated attitude of mind which has made the elan of the Mountain Gunner conspicuously outstanding. Rightly, they have been given a high precedence amongst fighting arms in all armies.

In the collections in the book, the reader will come across true tales of heroism, self-sacrifice, and trials and tribulations. These gunners lived hard and fought bravely. It was a matter of honour with them to provide timely fire support, whatever be the cost. It is no exaggeration to say that such virtues Indian Artillery inherited from its Mountain Gunners; for they provided the nucleus for the artillery expansion.

Mountain Artillery is expansive in men and animals. However, history has vindicated their vital necessity. The book also throws light on the social conditions of contemporary India, particularly about the frontier people. It is interesting to note that there were times when chicken curry could be obtained for twelve paise! Glimpses of polo, shikar, and trekking reveal the type of outdoor life prevalent in those days. Industrialisation, and civilization have lately caught up, and a radical reorientation of regimental life has become necessary. But the Regiment's aim continues to be the same as before to produce a devoted and competent team of gunners.

This is a useful book, particularly for young officers, and regimental libraries would do well to procure it for their use. —T.N.R.N.

THE CHINESE : HOW THEY LIVE AND WORK

T.R. Tiegear

(Published by David and Charles, Newton Abbot, 1973) Pp 164 Price £2.50

SINCE few travel to China and the Bamboo curtain effectively screens the Chinese mainland, there is a paucity of books on modern Chinese way of life. The author, Dr. Tiegear, has impressive credentials to write on this subject of commonly shared curiosity. He has twice taught at the central China university, the second spell coinciding with the establishment of the People's Republic of China. He has also visited China since and written two books on the geography of the Country.

The author apologises for the paucity of statistics. Yet in 160 pages he has condensed a mass of facts covering the country's geography, history, system of government, economic activity, transport, education, culture and sport. Attractively printed and bound, the book contains useful maps and eloquent photographic illustrations.

The momentous revolutionary experiment which China has been carrying out over the last twenty years involves creation of a modern industrialised State and changing her peoples fundamental incentive to work from personal gain to service of the whole country. The chapter on Mao Tse-tung's thought and writings is of particular interest in following the supplanting of ancient static philosophies by dynamic Marxism. The revolution is attempting to change the very nature of man and Dr Tre-gear emphatically lauds the aim though he may not whole heartedly accept the methods.

The achievement of the revolution are to be distinctly seen throughout the work. Talking of street cleanliness, for example, the author says that the Chinese standards would put most European and American cities to shame. Liberation of women receives an unreserved compliment. The author also attempts to dispel illfounded impressions in the West such as communist desire to disrupt family life.

The book, however, affords a somewhat perfunctory peek into the actualities of Chinese domestic life. One would have expected to read a lot more about food, clothing, costs, housing and so on than the meagre references in chapters 4 and 5. A detailed treatment of this aspect becomes all the more necessary as John Foster Dulles's "wild statement" that the individual is valued and allowed to survive only a labourer of the state.....' has been quoted verbatim. Nevertheless there is lasting interest throughout its pages and the book would make a welcome addition to public as well as private libraries.

—V.J.M.

THE INDIAN MINORITY IN BURMA: THE RISE AND DECLINE OF AN IMMIGRANT COMMUNITY

Nalini Ranjan Chakravarti

(Published by Oxford University Press, London, 1971) Pp 214 Price £3.25

A book devoted to an alien race, microscopic in demographic figures, is published for the Institute of Race Relations by the Oxford University Press, London. The Reviewer had picked it up out of curiosity. He recommends it to a reader with gratitude.

Dr. Nalini Ranjan Chakravarty, who takes up this study, brings to the book his training as a scholar, expertise as a senior public servant with the Fiance Department of the Government of Burma, his compassion for the Burman as well as the Indian in Burma, having been a member of an Indian family resident in Burma. A Minority, Dr. Chakravarty, defines, quoting the Secretary-General of the United Nations, in his Introduction to the book, is NOT a group of people who lose their separate identity when living with a Majority of a different ethnic origin,

language or culture but become a part of their adopted country even while keeping their separate identity. By that definition Indians were the most important minority community in Burma under the Government of Burma Act, 1935 and should have continued to stay a part of that country but for mistakes committed by the Indians, the Burmans, and the British rulers of the then British India Empire.

He traces the Indian immigration to Burma from the period of the three Anglo-Burman Wars of 1824—6, 1852 and 1885—6 which ended in the annexation of Burma, in three stages, to British India. Dr. Chakravarty details how, after the annexation of Lower Burma, in 1852, a large number of Indians were required to be brought over to Burma, not only for military and administrative purposes, but also to form the large labour force that was needed to clear, and develop the vast jungle-land that then was Burma. The most sparsely populated area in Burma, we note, was turned, in a few decades, to a thickly populated heart of the world's rice production. Evolution of Rangoon from a town of 30,000 people, in 1852, living in bamboo and timber huts, to a major Eastern port of about 500,000 people, in 1931, is the story of immigrant labour that reclaimed this city from the swamps that surrounded it, raised lands above flood-levels, constructed roads, drains and the buildings that spread cramped town into the Capital city of Burma. Why were these men not allowed to live in their adopted homeland to which they gave so much? How much were the minority community responsible for alienation from their majority Burman partners?

It is Dr. Chakravarty's point that Indians in Burma did not need to submerge their separate identity; the lengths they went in trying to protect themselves as Indians alienated them from the Burmans. Their trying to seek separate electoral representation, no doubt moved out of fears provoked, due primarily, to the British rulers' divisive policies, was a reaction that compounded this mistake. Indians in Burma could have kept their separate culture, and yet be better Burmans than Indians, but this did not happen, and, though, to a large extent, it were the discriminating policies of the Government that made them look inwards, with a wiser leadership they could yet have checked this drift.

The Burmans, on their part, had their prejudices towards Indians from the time of the Anglo-Burman Wars, when they found the invading British Armies largely composed of Indian forces. Burmans, on the other hand, till very late, found a very small representation in the Army. But there were two other major factors, Dr. Chakravarty points out, that set Burman attitudes towards their smaller Indian community.

The first was the large shifting Indian population, the manual labourers who came to Burma for work, collected their pay-packets and returned to India again. Dr. Chakravarty, by presenting comparable statistics, proves that mostly, half of the total Indian population consisted of these temporary residents, who would come to Burma on a contractual one or two year basis. The resident, domiciled Indian community always had the image of the Coolie, coming only to earn his pay, stuck with them. It did not help Burmans to consider this resident community as one of them.

The other factor was the disproportionately large sized Indian community in Rangoon. Indians were half the total population of the Burmese Capital, when there were only half as many Burmans in the city.

This to the Burman intellegentia, was a disturbing fact of life, and slid into the background the comparative smallness of their number in Burma. Dr. Chakravarty demolishes a largely held myth, by quoting authentic documentary evidence, of how just because of their preponderance in Rangoon the Indians in Burma gave anybody an impression of overshadowing the Burmans in their own country. Indians, in Burma, never formed more than 5% of the total population. Their preponderance in the Capital city overshadowed a Burman's view of them, and made them feel a minority in their own country.

Dr. Chakravarty's detailed treatment of the role of the Chettiars, the Indian banker in Burma, in the ups and downs of the Indian community gives the reader a clear idea of the tragic circumstances in which the Indian community was forced out of Burma.

A South Indian community of traditional small-time bankers, a Chettiar was a money-lender, never a tiller of lands. He came in seeing an opportunity to get good returns of money; his and borrowed, that he could loan to the Burmans for agricultural development. A virgin, underpopulated, largely jungle country needed capital too, aside of manual workers, and administrators, to work the untapped resources. The economic depression of the 30s, depressed rice prices, The loans could not be returned. Lands that were pledged with the Chettiars had to be willy-nilly taken over by them to recover something out of a miscarried investment. The Chettiars never had the smallest inclination to lock up their liquid assets in fixed property, by that was the only way left to them to salvage their large investments made to the Burman agriculturist. Eventually, the lands went back to the Burmans after the war and Independence. The Chettiars came back to India, like most other Indians, without any compensation for their efforts or their investments. But while the exodus, in spasms, took place, a Chettiar, like any other Indian was a despised, harassed man, who could have left much earlier if only he had something to go back to. He had staked his all in this removed part of the country and had come a pauper for doing so.

The British who ruled, and who alone were in the position of mitigating the sufferings of both these communities, found wisdom only in keeping them divided for their own imperious reasons. Political and economic differences between the Burmans and Indians were highlighted by the various Governors who came to Burma after, mostly, a bitter first-hand contact in mainland India with the Indian political movement. Differences, thus, were not only kept but accentuated. Geographical separation was not abridged. A railway link, that could have done a lot to give the two parts a sense of unity, was never made. That this in times of the Second World War, only helped a swift Japanese occupation of Burma, was realised even by the British rulers, but it was too late. The 1932 referendum, in which, despite a heavily loaded condition, the Burmans had opted for staying a part of the Indian Federation was disregarded as if it had never taken place. The two parts were

partitioned, and with that, the Indian and the Burman were destined to drift further apart.

And yet, this is Dr. Chakravartys' case, the two communities could have benefited by staying together.

Burma was a very underpopulated country for its size and its natural resources—tin, timber, rice, oil. The two communities could have given to each other what each in itself lacked. Capital labour and some public servants could have been the Indian communities' participation 'Weaving' was Burman, 'felling wood' was Indian. There was no clash, only complementing of work opportunities. A partnership in developing the country together would have been helpful to both the communities, and, perhaps, also, fascinating; and yet such a relation did not prosper. Indians came back to India, beaten by violence or the war, to their poverty and another start at a new life; Burmans stayed on, unhelped, fumbling with their new-won freedom, with a smaller work force, a shorter capital, their productivity declining, prosperity thinning, and yet both are free in their own ways. This is what Dr. Chakravarty tells us.

It is very searching dispassionate account of the predicament of a few people, in another country, and it tells us of why people become small when it is so easy to grow big together. Dr. Chakravarty has, painstakingly researched some inaccessible evidence, and lent it his scholarly and analytical intellect to keep the book at a level where not emotions but only facts speak. One may not blame him, but only credit him for being an Indian. He offers his first-hand knowledge, not his prejudices to us. One wants to thank him for writing a book like this, and with that, the Institute of Race Relations, London, for sponsoring such studies in human relations. Hugh Tinker, who contributes the foreward, recalls the trek, along with the general exodus during the war, 1942, and talks of it being natural to share in the disaster "when none of us quite knew why it had overtaken us. When one was trembling in the rigor of malaria, there were only brown faces to give what slender comfort they could. It did not seem important that they were brown: only that they were there". This is another view on the whole subject of minorities, be they of race or of colour, in this wide, alienating, fear-ridden world. V.K.

INDIAN VILLAGES IN TRANSITION

Durganand Sinha

(Published by associated Publishing House, New Delhi, 1969) Pp-232 Price Rs. 30.00

WE have tried to uplift the lot of our villages, more than 70% of our total population—after we gained Independence. The visual scene in any of our villages, no doubt has changed, under the effects of the various developmental efforts made to try and bring material prosperity to our long downtrodden, illiterate Indian villager. How much has our villager changed in his attitudes towards life? What has been the part played by the Community Development Programme, started in 1954, to try and reorient these attitudes towards an eagerness

for progress? What motivates an Indian villager? What are his hopes and fears? How high does he aspire in life? Professor Durganand Sinha in his book, *Indian Villages in Transition* takes up this challenging task of trying and evaluate the mind of an Indian villager. But he does not claim to pass any judgement on the work carried out by the Community Development Programme in our villages. He has tried, at the social psychology level, to set out some evaluation techniques. That, as an off shoot of this effort, one gets also an evidence of the results obtained by the Community Development Programme, is incidental. This book is primarily for a specialist in psychology. It would concern a layman only if he had a deep enough interest in the subject of our changing villages.

Professor Sinha undertook this task, on behalf of the National Institute of Community Development Hyderabad, and worked for two years, 1964 to 66, with his team of workers, in a few villages in Allahabad district of Uttar Pradesh. The book was published in 1969, and covers 6 villages, from 4 Blocks, 3 of them representing the 'Developed' and the other 3 the 'Undeveloped' villages. About 90% of the households were, on an average, investigated in these villages. The underlying idea behind this approach was to try and get extreme groups on the developmental scale, to come to a well-spread analysis of the field. A preliminary investigation, to test the efficacy of the evaluation techniques in the field, spread over a period of 6 months, helped Professor Sinha, and his team, to eliminate a few, adapt the rest, for the balance of the investigations. The tests finally selected and used were nine, and included such tests as the Projective Test for evaluating level of Aspiration of the villagers, the Happy Life Test to find out an average idea of what to the most subject minds was the Idea of an Happy Life. Personal Data Sheets included the socio-economic status of the subjects investigated. The Interviewers Rating Forms and the Village Reports, by the Interviewers were filled up last. The tests were sequenced, and well spread over a long period of time, ensuring uninfluenced flow of information from one test to the other.

The techniques adapted, like the Ladder Test, for assessing how well he found himself in life, as also some techniques evolved by Professor Sinha's team, which are a contribution to the field of Social Psychology, would be found very practical in the Indian conditions, where an average villager is, generally, illiterate and cannot, like his western counterpart, easily understand the terms and ideas used by a Western psychologist. The "Grain-sorting" technique, evolved to suit the Indian conditions by Professor Sinha's team indicates how well these tests are adapted to obtain the required information from our villager.

Three kinds of seeds, differing from each other in colour, size and texture were required to be sorted out by the subject—small white grains from the others. The fact that this test, to assess goal-setting behaviour, the level of aspiration, became very popular with the villagers indicates how well adapted to the villagers it was. That, it could, from the psychologists point of view too, reveal all the characteristics of a person the amount of risk a person is prepared to take, how realistic is his assessment of his own performance related with assessing Human Motivation of a person, his level of Aspiration, shows how well it answered the Investigation requirements. The test was carried out, about 6 times, on an average

with each individual, repeated within the similar duration of time. The estimate on How Many seeds he thinks he would be able correctly separate, before commencement of the test, was the "aspiration score", how well he thought he did, at the end of one performance was the "judgement score", the exact score being his "performance score". He is given another try at sorting out the grain, other steps remaining the same. The amount of satisfaction he obtained in finding out the relation between how much he thought he would achieve and what his exact score was, gave the "index of satisfaction-dissatisfaction." The subjects "goal-striving his "level of aspiration", the amount of risk he was prepared to take, all these facets of the level of aspiration to which he may rise were clearly marked out in each case. The investigator came to a conclusion whether the aspiration was "reality" oriented or "unrealistic." Professor Sinha has used many interesting techniques to evaluate how much" will for a better life does as Indian villager have. That these tests were carried out within the perimeters of the Block Development Circles, under the Community Development Programmes, gave also an indications of how much gauge these programmes were able to bring about in the thinking, attitudes, motivations of an Indian villager. Professor Sinha has come to some revealing conclusion at the end of his study.

There is no fundamental difference in the pattern of motivation and aspiration among the villagers from the "developed" and the "undeveloped" areas. The prevalent habit of "playing safe" and not taking risks has stayed a stumbling block for acceptance of new ideas and technology. His motivation still depended on immediate problems of subsistence and daily living. His hopes, aspirations and fears seldom transcended the purely personal or family spheres. Though the farmers from the developed areas appear a bit more motivated towards economic growth than those from the undeveloped areas, even amongst the developed areas the motivational changes are not deep. In our tradition bound country, village life does not seem to have changed very much. Complacent acceptance of poverty is still the rule. There has been some impact of the Community Development Programme but not at all sufficient to set in a chain reaction for the sake of Progress". The impact, the study reveals, will disappear once government patronage shifts. An Indian villager pathetically would still spend extravagantly on religious ceremonies like the *Bhandaras* and *Bhatbhats*. The outlook is not any more scientific than it was before the Community Development Programmes took root. Community feeling is absent. Only the local leadership counts-and that being, mostly, in the interests vested in status quo acts as obstruction to change. The study concludes by pointing out 4 psychological factors which have to be looked into if the programme of the accelerated change in the rural areas has to succeed. Bringing about a psychological change is a difficult process. But it has to be begun if our villages have to begin on a self-propelled dynamics of progress. The presumption, the book reveals, that our economic planners made that a psychological change in outlook and motivational level would automatically flow (in our hitherto poverty stricken and deprived villages) once economic opportunity begins to flow to the villages, they materially begin to progress, has proved false. Even with the material prosperity an Indian villager is as "deficiency-needy, motivationally, as he was before. There are, as yet, no signs of "growth needs" in the motivation of our villager.

We need to generate a strong urge for better living amongst our villagers. A community feeling is a must for a success of any of our village

programmes. Resistance to change must be overcome by training local leadership which should have interests in change not in status quo. If the community programme has failed, the study concludes, it is because of neglecting to look into the psychological dimensions of human progress, the material progress alone does not seem to have moved our villagers. More, not less, need be the involvement of our social scientists in the programmes to uplift the lot of our villager. This is Prof. Sinha's revealing analysis of the years of work after Independence, that has gone in to try and develop our villages. To the reviewer's mind, it is too important a finding to get locked up in a book on "techniques." He wished Professor Sinha had separated the two parts in, preferably, two books for two sets of readers, the Specialist and the Non-specialist, but interested lay reader. If he had done so, perhaps, the repetitions, that make for a rather windy exposition of the subject matter, could easily have been avoided. His printers and publishers too could have helped him, in his very valiant task, by bringing in more italics, bold print, and better produced photographs. As it is, to the reviewer's mind, the photographs hardly help the 'technique' aspect of the study, and do not motivate the lay reader. A book for him would, perhaps, have used pencil-drawn sketches of the interviewed subjects to a much better use than these familiar photographs of village scenes. It is a very important book to have been so haphazardly treated in its production, and its presentation. Perhaps Professor Sinha, and his dedicated team, would give an edition for the lay readers a thought.

V.K.

SIZE AND SEX COMPOSITION OF POPULATION IN INDIA.

By P. B. Desai.

(Published by Asia Publishing House, Bombay, 1969) Pp 263 Price Rs. 30.00.

M. JEAN DUCHE, a French writer, has recently made the terrifying prophecy that the Indian population may reach the 1759 million mark by 2070 AD, even if the growth rate is brought down to one percent a year. Against such background one wonders if the country is really taking the problem seriously. The results of demographic studies, however academic, should at least help constantly to remind us of the existence and gravity of the problem.

The book is the first of a series of studies undertaken by the Demographic Research Centre of the Institute of Economic Growth. The studies in the book under review based on the census data for the period 1901—1961 deal with two basic demographic variables viz the size and the sex ratio of the population. Profuse data have been provided by means of 91 tables in the main body of the book besides a dozen similar tables in the appendix.

The 1961 census had indicated that whilst population had increased at a rapid rate there was also a specific trend of decrease in the female proportion of the country's population. This decrease could be attributable to a change in the sex composition of births and a change in the sex differential of mortality. The book studies in depth the data of the

seven censuses in dealing with national population its rural and urban segments and populations in towns of different sizes.

The Indian population has all along been characterized by a female deficiency. The sex ratio has decreased from 972 in 1901 to 941 in 1961. It is interesting to note that the ratio is even more disproportionate in the case of Pakistan and China where it stood at 901 and 930 respectively in 1961.

The female deficiency in India is more pronounced in urban than rural areas. However, the ratio differs substantially from State to State. Half the States in fact have a female excess, notably Kerala where it seems to be further accentuating. With the exception of Bihar all States with female excess are in the south. Gujarat and Maharashtra have near equilibrium whereas Punjab has the maximum female deficiency.

The monograph will be of great value to those involved in demographic work.

V.J.M.

THE SPECIAL DIMENSION OF URBANIZATION: IN RELATION TO DEVELOPMENT PLANNING IN INDIA

By Sujit Banerji

(Published by Associated Publishing House, New Delhi, 1969) Pp 104 Price Rs. 18-00

THE author, a young 'I.A.S. officer, is presently Director of the Planning Organization, West Bengal. The book is a revision of his Master's thesis submitted to the University of Wisconsin, Madison, USA. The work makes a critical study of the planning machinery in India and highlights one area, namely the spatial dimension, for greater attention.

Earlier critics of this aspect have focused attention on town-size, migration patterns, industrial location, new towns and centralization versus decentralization of people and activities. The author contends that programmes for national development, though concerned at national level, do not affect all centres of population but only particular centres of population concentration within the nation. The approach to planning has so far been to formulate public policy for maximizing national income and optimum resource allocation between different sectors of economy. The national Five Year Plans do not spell out the pattern of development for individual states. State Plans also do not incorporate the pattern of development of areas units. Thus the phenomenon of urbanization which generates a host of problems has been neglected.

If the present trend is continued, the author feels, in West Bengal "The Calcutta Metropolitan District will continue to dominate the region like a colossus". He suggests two alternatives. The First is to design an independent regional urban system based on North-South linkages superimposed on the existing transport patterns. This will approximate a hierarchical system of regional cities strategically distributed and inter-

acting along East-West and proposed North-South transportation linkages. The second alternative is promoting a constellation of urbanized corridors on the existing transport routes.

The book does not fully evaluate each alternative and thus comes to a rather abrupt end. The author is well aware of this when he concludes that "The guidelines offered in this study might generate a set of unidentified problems which will have to be met incrementally as they arise." He however firmly establishes the need to work out a concept of spatial planning and identify its areas of concern.

V.J.M.

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The Editor, USI Journal,

Sir,

PAY MINUS PENSION

For a long time now, the retired Service officer has been fighting a losing battle in trying to remove the anomaly in the pay fixation, that exists between him and the civil government servant re-employed in Public Sector undertakings. As things stand today, the civilian government officer, who comes on deputation to the Public Sector and then opts for permanency in it, is eligible to draw his pro-rata pension in addition to his pay of appointment. On the other hand, a retired Service officer when he joins the Public Sector, can only get his pay of appointment, but has to forfeit his pension.

2. In accordance with the Ministry of Finance, Bureau of Public Enterprise letters No 2(57)/68(OM) dated 23 Sep 69 and 3 Jan 70, government officers in Public Sector have been classified in the following two categories with regard to the pensionary benefits :—

- (a) *Deputationists* (99% of whom can only be Civil Government employees)

Those officers who are on deputation with public undertakings, but who, later on, opt for permanency. These officers are allowed their pay of appointment plus pro-rata pension which they may have earned in their parent department.

- (b) *Retired Officers* (99% of whom are only Service Officers)

Those officers who retire and then join a public undertaking. Such officers are only entitled to the pay of appointment, but minus the pension that they may have earned with their parent department.

3. To begin with, why there should be any differentiation between the above two categories, is not clear. It will be appreciated, that if anything, it should be the reverse, for the following reasons :—

- (a) Deputationists are still very much in service, as such the question of their pension etc. should not arise till such time as they retire.
- (b) Retired officers on the other hand, have already earned their pension in respect of service rendered in their parent department, as such it should have no relation with their new appointment in public undertakings.

The above anomaly must first be sorted out.

4. Secondly, what is not being appreciated is, that whereas in the first category, namely, the deputationists, 99% of the officers will invariably be from civil departments, like IAS, Railways, PWD etc, only 1% will be from the Armed Forces. This is obvious due to the fact that, as

officers of the Armed Forces have to retire at an early age, they are forced to seek re-employment only after retirement, as before that they would not have the necessary experience to qualify for the Public Sector appointment. This however is not the case with the civil government officers, who due to longer retirement age limit, have ample time and scope to go on deputation during the tenure of their service. In any case the civilian officers cannot join the public sector after retirement, as the age for retirement both in the civil departments of the government and the public sector is the same. In other words, on the face of it, the Bureau of Public Enterprise's policy letters mentioned above, literally tend to amount to saying, that :—

- (a) civil officers, who have opted for permanency in public undertakings, will get their pay of appointment plus pension, however,
- (b) army officers, who are re-employed in public undertakings, will only get their pay of appointment, but less pension. As explained above, hardly one percent of Service officers will be those who have gone on deputation and then opted for permanent absorption in public undertakings, as their early retirement will not normally allow them this choice.

5. As is well known, in the past almost all the public sector undertakings were headed by ICS/IAS officers on deputation. In order to prevent them from returning to their parent cadre, and thus not reverting the officers who had taken their place therein, an inducement in the way of pensionary benefits was made to them, so that they would continue to remain with the public sector. On the face of it, these rules appear to have been framed mainly for the benefit of the ICS/IAS officers on deputation, and who now are reluctant to extend this to retired Service officers.

6. The argument normally advanced by the civilian officers, namely, that (a) pension rates of Service officers are better than those of corresponding civilian officers, both Service and civilian, employed in public sector undertakings are identical, is not really relevant to the main issue. Regarding the first argument, namely, higher pension rates for the Service officer, what is being completely lost sight of is the fact, that a mere Rs 100 or so of higher pension is no compensation for almost 10 years loss of service due to early retirement. In connection with the latter argument, regarding identical rules applying to both the Service and civilian officers, what has not been appreciated is the fact that, whereas 99% of the deputationists can only be from civil government departments, on the other hand for obvious reason, 99% of retired officers can only be from the Armed Forces. The crux of the matter is, that whereas all civil officers can derive the benefit of the rule, hardly 1% of the Army officers can do so. If I may be permitted to say so, as usual, we Service officers are being taken for a ride.

7. Appeals on this matter made to the DG Resettlement and the Chairman Ex-Servicemen's League, have proved futile. I hope this letter if published in the Journal, will generate enough interest in senior serving officers, so that the matter can be forcefully taken up with the government at the Chiefs of Staff level.

SECRETARY'S NOTES

Members' Address

Copies of the Journal posted to members are sometimes returned undelivered by the Post Office with remarks such as 'the addressee has been transferred,' etc. This appears to be on the increase and the only way to rectify it is for members to drop a line to the Secretary whenever their addresses change due to promotion, transfer, etc. It is of the utmost importance that the Institution should have the up-to-date addresses of all its members.

Annual Subscription

Although the Institute's year 1974 is now six month old, I regret to say that there are still many members who have not yet paid their subscription which was due on the 1st January last. Could I therefore request all members who have not yet paid their subscription for the current year, to let me have their remittance by return of post.

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From 1st April to 30th June 1974 the following members joined the Institution :

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- | | |
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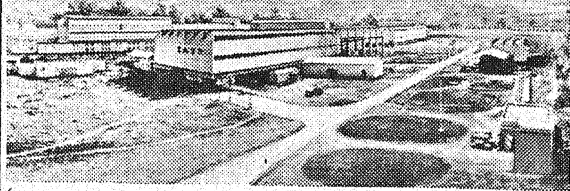
- USI membership number, if already a member.
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